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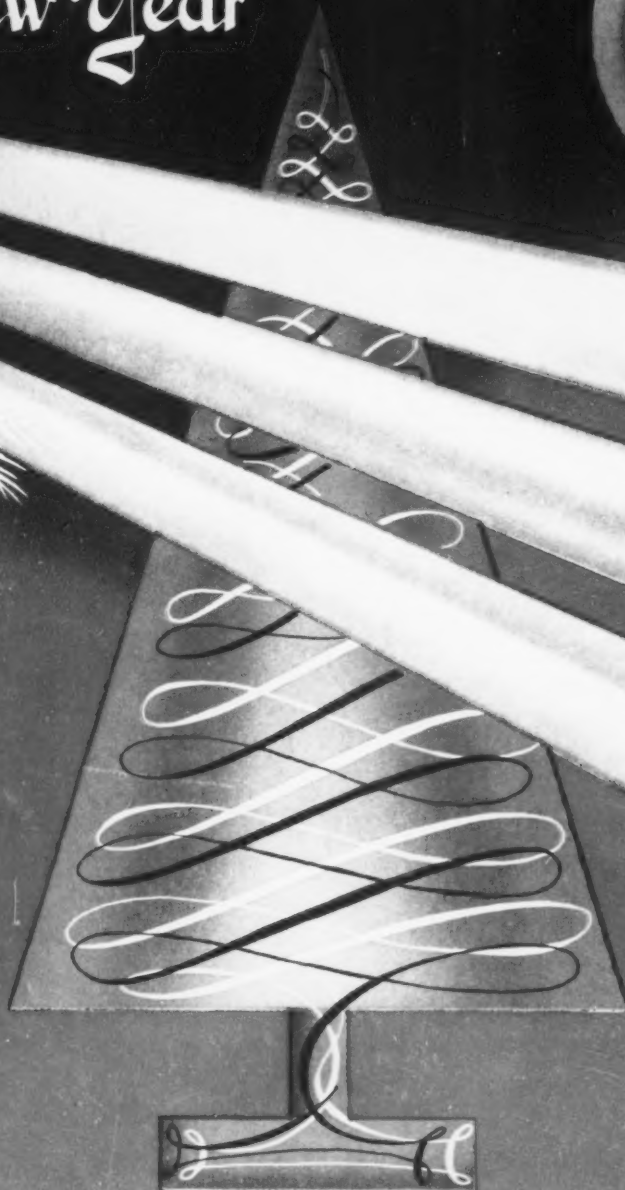
The Iron Age

THE NATIONAL METALWORKING WEEKLY

December 18, 1952

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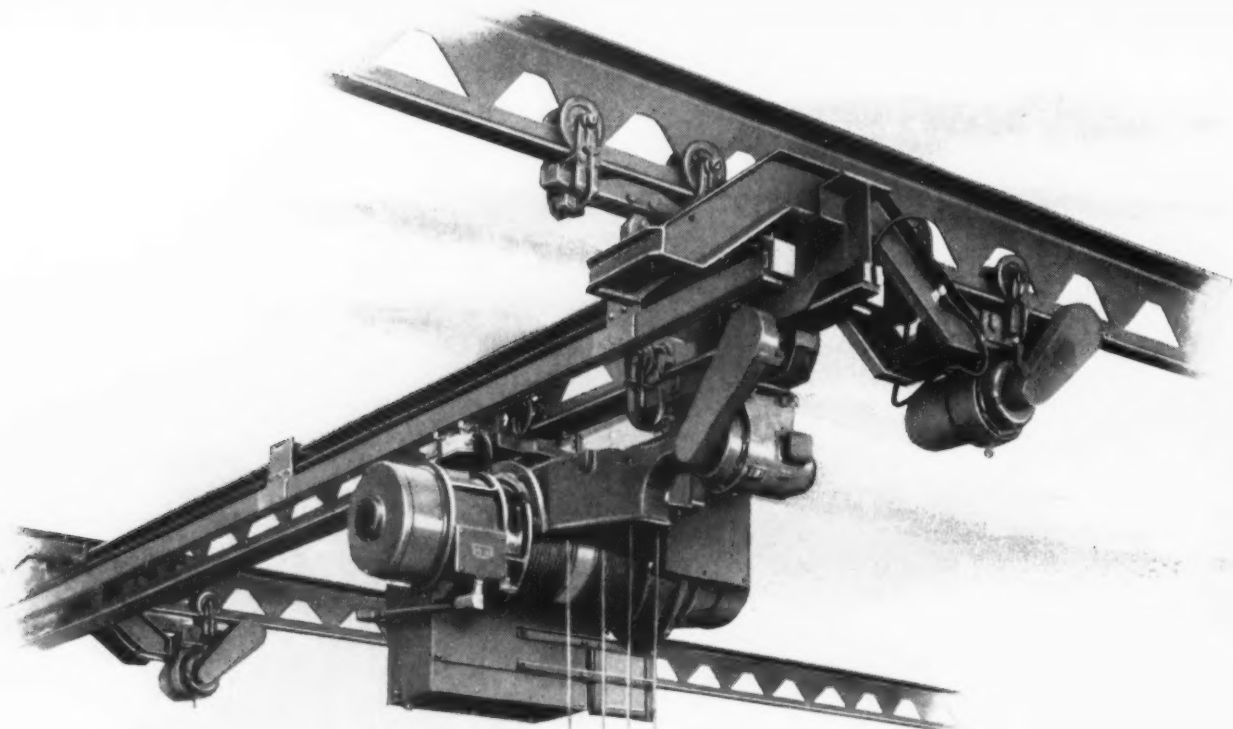
Merry Christmas
And a
Happy New Year



MANUFACTURERS OF HIGHEST QUALITY
ELECTRIC-WELD STEEL TUBING

NIKOH TUBE COMPANY

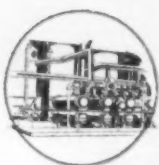
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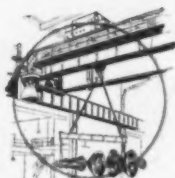
This Super "High" Way Cuts Handling Costs!



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Trackmobile



Swenson Equipment for
the Process Industries



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Cranes

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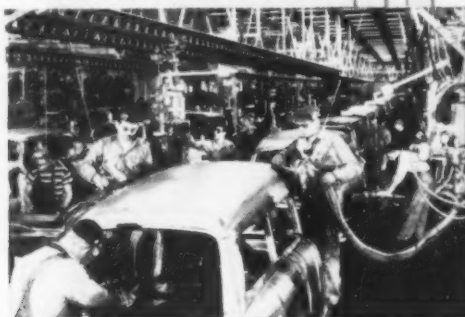
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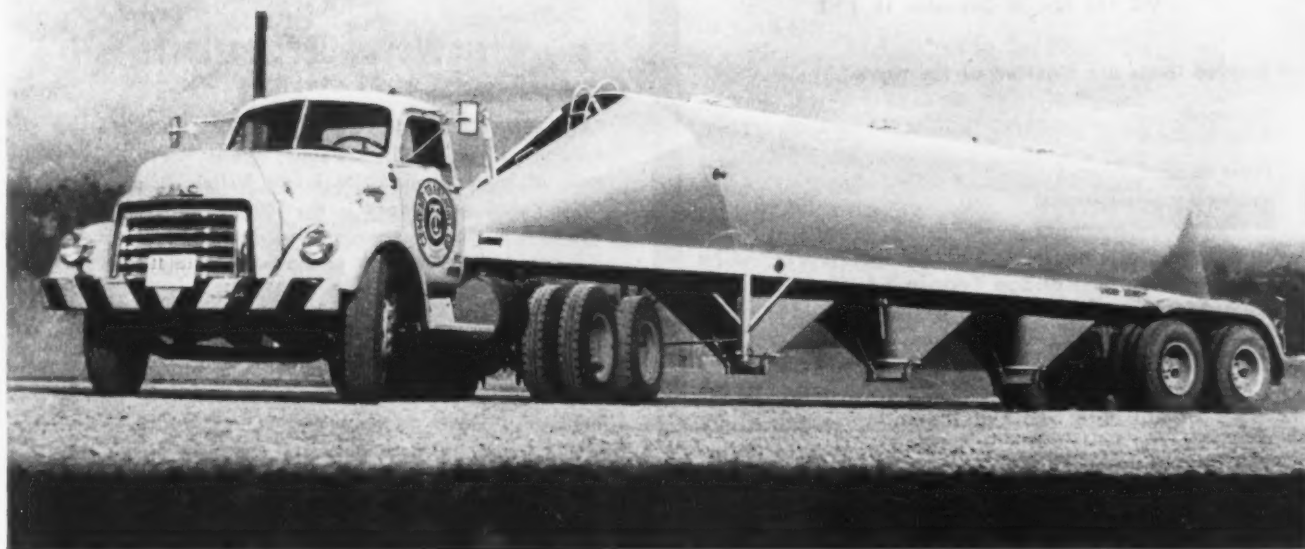


Modern handling for the new Nash!
Whiting Trambeam monorail systems help
speed spot welding and assembly at
this automotive leader's Kenosha, Wis., plant!

WHITING
TRAMBEAM® OVERHEAD
HANDLING SYSTEMS



This 120-barrel capacity bulk cement trailer was built of Mayari R low-alloy, high-strength steel by Clough Equipment Service, Seattle, Washington.



THEY CUT 1500 LBS DEADWEIGHT FROM THIS BULK CEMENT TRAILER

Low-alloy, high-strength steel did it. By using Mayari R the builders of this bulk cement semi-trailer were able to reduce the deadweight by 1500 lbs while adding to the overall strength.

The trailer has an all-welded tank-type hopper body, dual axles, flanged-and-dished hopper heads, air jets and vibrators. Heavy truss frames ordinarily used in trailers of this type have been eliminated. Excellent roadability and stability

have been gained by lowering the center line of load.

Mayari R is well suited for vehicles like this because of its higher mechanical properties. It enables designers to use thinner, lighter sections without cutting strength or corrosion-resistance. You can use Mayari R in the as-rolled condition without heat-treatment. You can form and fabricate it by the same methods that you use for plain carbon steel, and weld it by

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Mayari R *makes it lighter... stronger... longer lasting*

December 18, 1952

The Iron Age

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THE IRON AGE, published every Thursday by the CHILTON CO. (INC.), Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1933, at the Post Office at Philadelphia under the act of March 3, 1879. \$8 yearly in United States, its territories and Canada; other Western Hemisphere Countries, \$15; other Foreign Countries, \$25 per year. Single copies, 35¢. Annual Review and Metal Industry Facts Issue, \$2.00. Cables: "Ironage," N. Y.

DIGEST of

NEWS DEVELOPMENTS

FAIRLESS WORKS AIDS DELAWARE VALLEY BOOM—P. 75

Building of the huge new Fairless Works has touched off a wave of industrial expansion in the historic Delaware Valley. As first steel was tapped in the \$400 million plant last week expansion in the Valley was nearing the \$4 billion mark. About 300 plants are being built or expanding in the area.

BEST BRIDGE BUILDING YEAR IS COMING UP—P. 78

Basing his estimate on the number of jobs coming up and the tonnages involved, one fabricator said, "We'll have bridges coming out of our ears." Construction prospects for schools, institutions are almost as optimistic. But commercial construction may not fare as well. Cost estimates have climbed.

USE OF PLASTIC AUTO DIES KEEPS GROWING—P. 79

Automakers continue to find new, specialized uses for plastic dies. The public has not yet been tipped off to all of them, but there are some leaks. Short runs, particularly on luxury models, and pilot production seem most promising fields at present. Short length of run is still most serious drawback.

OIL INDUSTRY STORAGE TANK NEED GROWS—P. 84

Oil industry need for steel plate to build storage tanks is likely to grow in 1953 as fuel suppliers continue expansion. They are working on an 18-month program to push tank capacity to 153 million bbl in the U. S. and 35 million bbl abroad. PAD is working on yet another goal for oil storage tanks.

CARMAKERS GET PERMISSION BUT NOT METAL—P. 92

Automakers are allowed to build 1.25 million cars in first period, 1.5 million in second, but metal allocations are for fewer units. Steel has been allocated for only 843,000 cars in first quarter. Second period quotas of 1.25 million are expected. Copper should be adequate, but aluminum could be critical.

ALASKA BOOMS DESPITE CLIMATE DRAWBACKS—P. 101

Alaska is now experiencing the greatest construction boom in its history. It is asking West Coast contractors to help it build. Bids are open for \$240 million contracts for 112 jobs in 1953. Cold, permafrost pose formidable building problems. Previously untapped riches are now being developed.

the Week in Metalworking

ENGINEERING & PRODUCTION

CONVEYERIZED ORE DOCK SPEEDS LOADING—P. 133

Installation of another crane and handling of all ore by conveyor enabled the Canton Co. to increase the capacity of its ore dock to 3000 tons of ore per hr. Using three loading tracks 19.2 cars per hr are loaded. Weighing is automatic. Bins and feeders handle different ores and all types of cars.

CAST REFRACTORY REPLACES BRICK LINING—P. 140

A new cast refractory material has been tested as a substitute for all-brick refractory in a barrel-type forging furnace. While tests are still incomplete, indications point to comparative freedom from spalling and longer furnace life. Maintenance costs were reduced when using the new material.

CHIP DISPOSAL HANDLED AUTOMATICALLY—P. 142

"Chip Engineering" got a top priority at Ford's new Cleveland engine plant. Ingenious steps taken at the plant to remove chips automatically from machines and keep them from interfering with machining operations constitute a new and interesting chapter in high production machining.

LOWER COSTS WITH PRE-COATED COIL STOCK—P. 145

Pre-coated coil can now be used in a wide variety of light fabricating operations. Stamping, piercing, intricate embossing and deep and severe drawing can now be performed without damage to the finish. Finish is more consistent than dipping and spraying. Paint shop personnel is reduced.

GRAIN SIZE KEY TO MECHANICAL PROPERTIES—P. 148

Mechanical properties of metals and alloys show a marked rise and fall with changes in grain size. Tensile strength, yield point, hardness, area-contraction show varying degrees of change. Differences in Al, Cu and brass are due to orientation and porosity concentration along crystal boundaries.

NEXT WEEK—UNIQUE SETUPS SPEED PRODUCTION

At Ross Gear & Tool Co. rough and finish hobbing tools are used on a 100-ton hydraulic press to "plug" tapered serrations in a tapered hole. Wide integral keys on piston are produced by hobbing with a formed cutter. These and other setups have facilitated output of cam and lever steering gears.

MARKETS & PRICES

RAILS RENEW PLEA FOR FREIGHT CAR GOAL—P. 81

The railroads are once again asking that we live up to a previously set goal of 10,000 freight cars a month. They have set a target for a 1,850,000 freight car fleet by the end of 1954. Railroads were disillusioned when production fell below the goal. Limiting factor continues to be supplies of steel.

NOTE SHIFTS IN COMMUNIST BUYING HABITS—P. 86

Russia and her satellites continue international trading. U. S. State Dept. attempts to dam flow are only partly effective. Reds pay going world prices. Patterns have shifted from steel in '47 to '50 to alloys and machinery. Top demand now is on precision instruments and spare parts for machinery.

MACHINE TOOL OUTLOOK—SLOW THEN GO—P. 103

With backlogs in the machine tool industry still declining, there may be a loss in machine tool capacity during the winter. But this may be followed by a speed-up of business activity. Many firms are seeking new orders to fill shrinking order books. What's more they are promising normal deliveries.

CANADA'S OUTPUT MAY DOUBLE IN 25 YEARS—P. 105

A leader in natural resources, Canada is exploiting its trove of mineral treasures in impressive volume. This has been more pronounced in the past 4 to 5 years. The country is now a major exporter. It is reaching for more independence from steel imports through a growing domestic steelmaking capacity.

STEEL PRODUCTION, USE REACH NEW HIGHS—P. 173

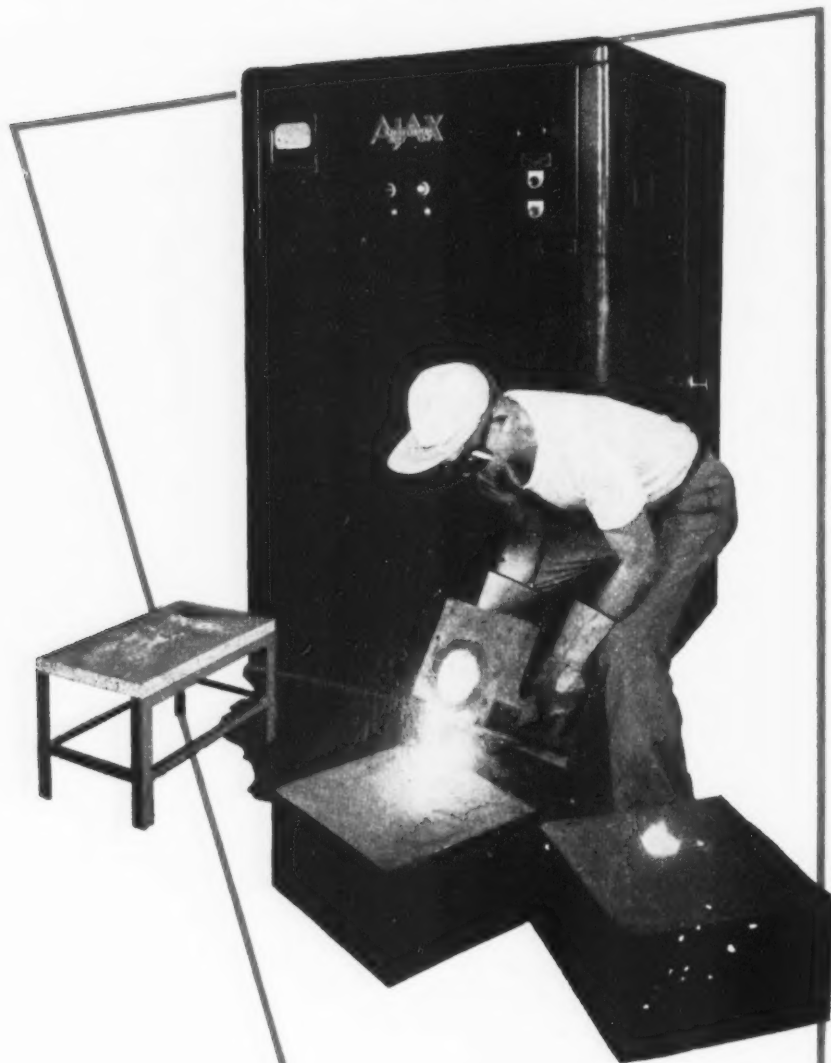
Optimism of steel producers for 1953 is on solid ground. Consumers are still clutching for every pound of metal they can lay their hands on. The mad rush for metal seems to have enough momentum to carry it for some time. Conversion is still a very strong factor under driving consumer pressure.

MAY PICK ALUMINUM SITE IN WEST VIRGINIA—P. 176

One report has Olin Industries, Inc., building its 110,000-ton aluminum smelter in West Virginia. Another says no decision has been made. Latter seems unlikely in view of detailed cost estimates which had to be made. Southeast power situation brighter but Northwest losses remain heavy.

Now The Precision and Speed of Induction Melting

... FOR MELTS FROM 3 TO 60 POUNDS
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LABORATORY MELTING:

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Send for free technical bulletin 14-A.

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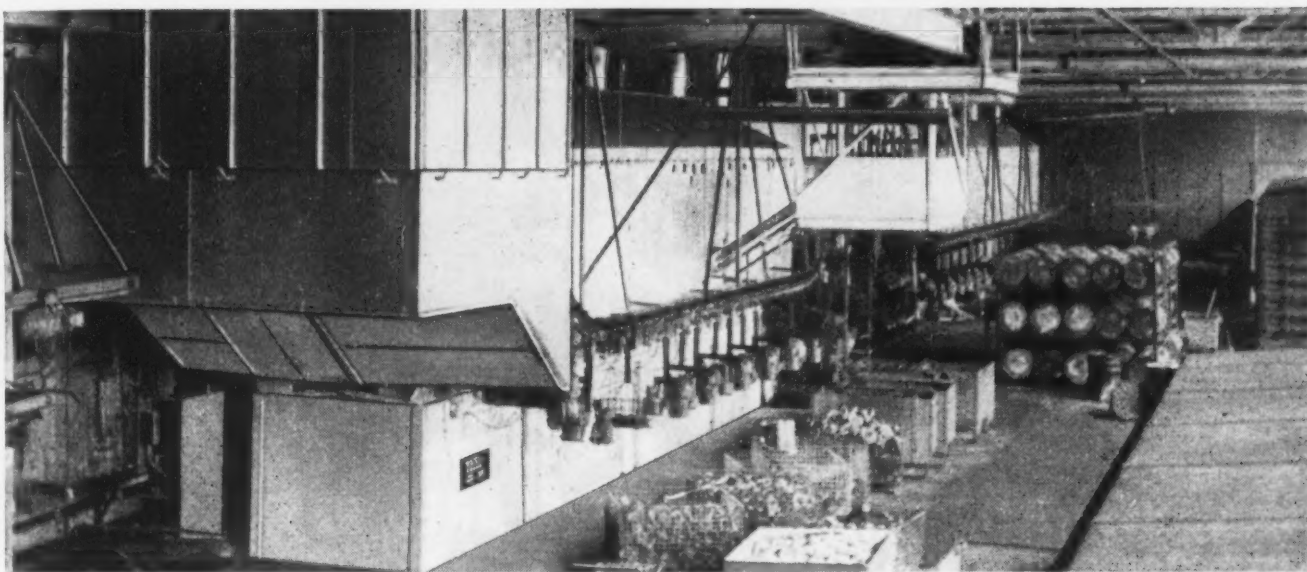
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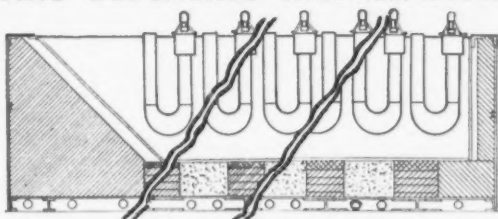
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SUNBEAM INDUSTRIAL
FURNACES MEET
THE DEMANDS
ON THE
PRODUCTION FRONT

SIMULTANEOUSLY ANNEALING, DESANDING AND DESCALING CASTINGS



PLAN VIEW— ANNEALING, DESANDING AND DESCALING INSTALLATION



This Sunbeam Stewart Salt Bath furnace has a pot 41 ft. long by 4 ft. wide by 4 ft. deep. Forty U-shaped immersion heating tubes, each equipped with a pressure burner of the flame retention type having an individual pilot burner, provide the necessary heat and control for maintaining the bath at proper working temperature. Burners are arranged in three temperature control zones extending the length of the furnace to assure uniform heating throughout the entire length of the bath.

To economically prepare automotive housings for final fabrication, one large manufacturer of automotive equipment required a molten caustic bath capable of descaling, dissolving all embedded foundry sands, while providing a stress relieving and softening annealing cycle. By combining these operations into one completely automatic unit, it was possible to eliminate separate installations, overcome additional handling costs and also reduce floor area.

Handling of castings is completely automatic from the loading of as-received work from box-cars through the entire process. Time and cycle is approximately 4½ minutes in the salt. Temperature is usually between 1100° and 1200°F., depending upon the characteristic of the work.

Although this particular installation is used primarily for castings, this equipment will successfully handle forgings, hot headed bolts, wire and wire products, etc., where scale must be removed before the product is completed. This design is available covering practically all types and sizes of work in both the continuous and batch type systems.

IF YOU ARE CONSIDERING DEFENSE WORK CALL SUNBEAM. Designs are available for heat treating the following materials:

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FORGINGS: Rotary Hearth and Pusher-type Forging Furnaces.

ARMOR PIERCING SHOT (Harden, Quench and Draw).

CARTRIDGE CASES (Anneal, Stress Relieve).

MACHINE GUN CLIPS (Harden, Quench and Draw).

JET AIRCRAFT and TANK PARTS

**Sunbeam
STEWART**

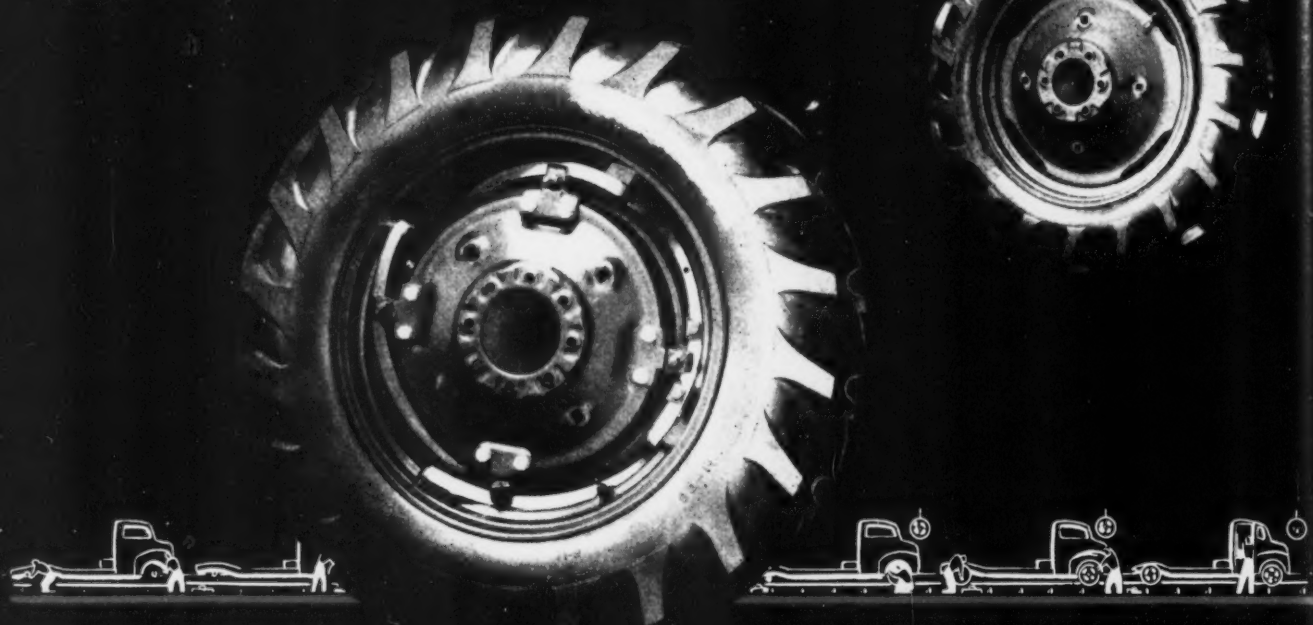
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A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM industrial furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM engineer will be glad to call and discuss your heat treating problems with you.

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amazing speeds — each one a perfect circle of weight and balance.

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Leading wheel makers have learned they can trust Sharon to deliver this kind of steel day in and day out — that's why today Sharon is one of the leading producers of strip steel for the continuous production of rims and wheels.

***Specialists in STAINLESS, ALLOY, COLD ROLLED and COATED Strip Steels.**

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Editorial

The Iron Age

FOUNDED 1855

How to Get Ahead

RECENTLY we have had a rash of books on "How To." Many tell us how to live long; how to be happy; how to fix a leak; how to remain sane while others go crazy.

Then there are more subtle books: What your wife should not say to the boss; how bright the shine should be on your shoes; how to train your children to say the right thing; or how not to look like an eager beaver.

Most of these treatises are good books. They offer you a short-cut to happiness, knowledge, sociability, millions or peace of mind.

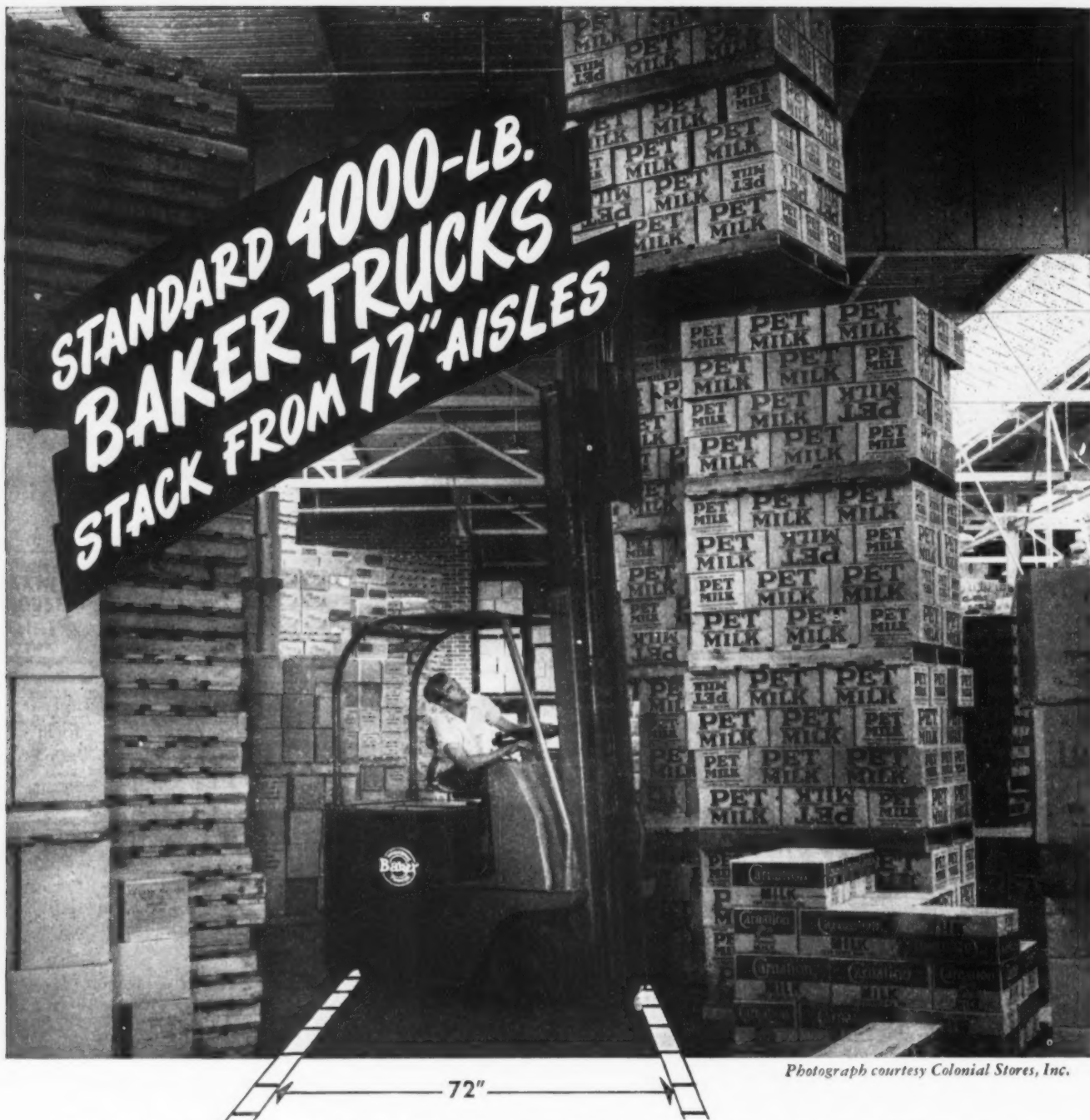
Here are our ten rules on how to get ahead:

- (1) Don't blow your cigarette smoke in the boss' face when you are in conference with him. He wants to see your face.
- (2) Face the boss when he is talking to you so there is a window behind him. That way he can see your reaction but you can't see his.
- (3) Don't invite the boss to your home for dinner. No matter what you serve it won't be right. The probability of it going against you is so great it isn't worth the effort.
- (4) Don't open your conversation with, "How do you think I ought to do this?" Maybe he doesn't know and you are supposed to know.
- (5) Find out what his politics are before you say "yes" or "no." He may be a member of the other party. This goes for religion too.
- (6) If he uses your idea later be sure to congratulate him. Under no circumstances should you murmur, "Yes, that's what I said a week ago." It won't get you anything.
- (7) Don't rely on chlorophyll, it may not work. For business reasons onions are never good at noon.
- (8) Excuses won't work. He won't believe them. They leave you wide open for what you didn't do last week that he didn't mention.
- (9) Don't say, "Is this an order?" What more can he say but, "Yes." If in doubt just say, "I won't do it." Then see what happens.
- (10) Don't pay any attention to where you are going in the company. Leave that up to cloakroom dopesters. Do a good day's work and a little extra. It's a lost art but it pays off.

Score 10 for each one right. Scores: 10—get another job; 20—still get another job; 30—you are learning (so are we); 40—good; 50—you are in; 60 to 100—you are either the boss or you are cheating.

Tom Campbell

Editor



Photograph courtesy Colonial Stores, Inc.

Here's how to make the best use of warehouse space—horizontally and vertically. By combining the flexibility of Baker Fork Trucks with scientifically planned oblique stacking you get small truck maneuverability with standard truck speed and capacity. Other advantages are less operator fatigue and longer service between battery charges.

Write for 6 page special report containing charts, diagrams, floor plans and photographs showing benefits of oblique stacking with Baker Trucks.

Oblique stacking with Baker Trucks minimizes aisle requirements, reduces truck travel, speeds storing and stock selection, and simplifies inventory checking. Illustration shows a 4000 pound Baker Truck operating in 72" aisles, stacking merchandise right up to the 25-foot ceiling... two pallet loads at a time.

Baker

INDUSTRIAL TRUCKS

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1227 West 80th Street, Cleveland 2, Ohio

Please send me the special report "There's an angle to Increasing Existing Storage Space."

Name Title
Company
Address
City State

Dear Editor:

Letters from readers

Metals For Tomorrow

Sir:

Your "Metals for Tomorrow" articles are excellent indeed—and your "Wonder Metal" paragraph was just wonderful too.

On p. 285 of the Oct. 9 issue you note that, "One use which is apparently developing for vanadium is as an alloy with titanium and molybdenum." I infer from this phrasing that you have reference to a vanadium-base alloy. I would like to know whether this is the case.

W. L. FINLAY
Research Manager

Rem-Cru Titanium, Inc.
Midland, Pa.

You are correct, we were referring to a vanadium-base alloy.—Ed.

Another Stainless Steel

Sir:

We have noted the item on the Newsfront page of your Dec. 4 issue stating that type 430 stainless, used as a replacement for 18-8, is being displaced by a 16 Cr—16 Mn nitrogen bearing steel.

Will you kindly furnish us the name of the manufacturer of this material as we wish to obtain additional data.

W. H. BURTON
Materials Engineer

General Chemical Div.
Allied Chemical & Dye Corp.
Camden, N. J.

Among the manufacturers of this new grade of stainless are: Allegheny Ludlum Steel Corp., Crucible Steel Co. of America and Republic Steel Corp.—Ed.

Chromium Plating

Sir:

We are interested in the following statement made in a Technical Brief item on p. 220 of your Nov. 6 issue:

"Among electroplaters, it is known that chromium cannot be plated directly upon steel and achieve satisfactory adhesion. It is always necessary to plate on some other metal or prepared surface."

Nearly 100 pct of our production consists of applying chromium directly to such basis metals as carbon and alloy steels, cast steel, cast iron and other ferrous alloys without the use of an interfacing of some other metal. The degree of adhesion which we obtain can be best described by the fact that surfaces can be hammered, pounded, distorted without the chromium deposit actually flaking from the surface of the steel to which it has

been applied. In most instances, the chromium deposit will break or crack within itself before separating from the basis metal.

J. B. ALLEN
Sales Manager

Chromium Corp. of America
Chicago

The Customer Is Back

Sir:

In the Nov. 6 issue there appeared an editorial entitled "The Customer Is Back." I would very much like to secure 40 or 50 reprints of this editorial if they are available.

K. M. HAY
Sales Manager

Commercial Container Div.
Ball Bros. Co.
Muncie, Ind.

Metallic Filler

Sir:

We are very much interested in the story on a synthetic metal, which was described on p. 186 of the Nov. 13 issue, for use in the repair of patterns in the Lancaster Malleable Castings Co.

We would appreciate the name of the supplier from whom the metallic filler may be obtained.

W. H. STOLTENBERG
Blackhawk Foundry & Machine Co.
Davenport, Iowa

The manufacturer of the metallic filler is A. L. Okun Co., 148-26 58th Ave., Flushing 55, N. Y.—Ed.

Direct Reduction

Sir:

Your interesting article "Steel: What Will the Industry's Future Be?" in the Oct. 9 issue came to my attention, particularly your statement regarding the "direct reduction" process of two types.

I believe someone will develop a superior and much cheaper method of making steel by direct reduction, as I am convinced it can be done. Do you know where I can get any descriptive matter published about the two developments you mentioned?

C. C. BLACKMORE

Dayton

A good discussion of several methods of direct reduction appears in "Resources for Freedom", a report to the President by the President's Materials Policy Commission; vol. IV "The Promise of Technology", p. 34. The volume can be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.—Ed.

PRIME MOVER of INVENTORIES

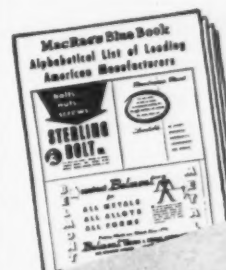


INDUSTRY'S "WORKHORSE"

Invites advertisers into its 60th edition

Next year, the 60th consecutive annual edition of MacRae's Blue Book will again produce top-quality inquiries for the thousands of advertisers who will describe their products in this most-favored, most accessible of industrial directories. Shouldn't you have the details of its pulling power?

This handy address directory, at left, sent free to all recipients of the current edition of MacRae's Blue Book, has been received with enthusiasm.



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single copy costs and
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MacRAE'S BLUE BOOK

America's Greatest Buying Guide
18 East Huron St., Chicago 11, Ill.



When sirens scream and fire trucks roar through the streets to battle a blaze caused by a hydraulic line breaking in your die-casting plant, it's *too late*. Too late to prevent a fire. Too late to save lost production due to machinery and building damage. Too late, perhaps, to prevent injury or death to employees.

You can reduce the possibilities of such a disaster by switching to Monsanto Pydraul F-9 . . . *now*. You can change to Pydraul F-9 simply by draining the hydraulic system and refilling with the Monsanto product.

Pydraul F-9 is Monsanto's nonflammable-type hydraulic fluid. Under test conditions, it does not flash or ignite when sprayed, dripped or flooded on molten metal heated to approximately 1,500° F.,

nor does it ignite or flash when sprayed, at 1,000 p.s.i., into the 6,000° zone of an oxyacetylene flame. Users say Pydraul F-9 has prevented fires in their plants.

In addition to increased *safety*, you get *efficiency* and *economy* when you switch to Pydraul F-9. The fluid has high resistance to mechanical shear and chemical breakdown. It is high in lubricity and does not corrode metals from which machines are constructed.

Investigate the increased safety, efficiency and economy of Monsanto Pydraul F-9 today. Contact the nearest Monsanto Sales Office or write for a copy of the 12-page, file-size booklet, "Pydraul F-9." MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri.

DISTRICT SALES OFFICES:
Birmingham, Boston, Charlotte,
Chicago, Cincinnati, Cleveland,
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ada Limited, Montreal.

Pydraul: Reg. U. S. Pat. Off.

PYDRAUL F-9



SERVING INDUSTRY...WHICH SERVES MANKIND

Fatigue Cracks

by William M. Coffey

Hip, Hip, Huzzah!

STOP! If you haven't yet read Editor Tom Campbell's editorial, turn back to page 7 and read it. Go on, hurry up. We'll wait . . .

(waiting)

. . . real funny, ain't it. Makes us look sick, don't it? Our campaign to convince everybody here that they made a mistake putting Fatigue Cracks in our bag has resulted in total victory . . . unconditional surrender. Napoleon said it—*Victoire, c'est ours*. From now on Mr. Campbell, the Editor-in-Chief, is taking over Fatigue Cracks and we're going to write the editorials, a job for which in training and industry know-how we are eminently better suited. Watch next week. Our editorial will crack the lid off the "heat treating of lead coatings by the Bessemer Process" or "how to sell spline shafts by mail." It will have power and punch and those people in Washington are going to yell "uncle." Think we'll call it "Let's Nail It Down."

Last Crack

. . . but before taking over the Editorials, here's one last, corny joke sent in by Mr. N. P. Stauffer, Jr., of Phila., who seems as eager as Mr. Campbell to get us out of here:

A progressively educated child was grouchy at breakfast. The indulgent parents inquired as to why.

"I want a worm for breakfast," bawled the child.

Obligingly the parents promptly unearthed a worm and prepared it tastily. The brat bawled again.

"I want Daddy to eat half," she wailed.

Reluctantly, Daddy ate one half of the worm and then turned expectantly, all smiles, to the child. Once again she burst into tears and said,

"Daddy ate the wrong half."

The moral of this tale is that parents, who are educating chil-

dren, should know one end of a worm from another.

Reader Service Department

We received this letter yesterday from a long-time subscriber: "Dear Sir—My roommate and me are vitiporously interested in the properties of iron and steel, especially the kind they make bars out of with. In connection with this would you please forward any data on steel cutting tools, or send the tools?" Signed, #3,456,759, State Prison. "P.S. We all read THE IRON AGE here and like it very much, particularly that funny fellow who writes those funny editorials."

Answer: "Thank you extremely for your inquiry and your kind, but undeserved woids. We have in the printing stage the new, 1953 edition of the DIRECTORY OF STEEL TOOLS. This handy directory will contain the names and addresses of the producers, importers and distributors of tool, metal cutting and die steels, listing alloys, trade names and characteristics. When it comes out we'll be happy to send you and your roommate a copy." Signed #2,437,980, The Iron Age. "P. S. How's old #1,763,982?"

Puzzlers

All we can say is that Mr. Hudson is mighty lucky he didn't offer a box of cigars to all who solved his alley-ladder problem, for here are some more winners: Joseph Voldrich, Buchanan, Mich.; Woddy Ulrich, Hagerstown, Ind.; Houston Hendley, Columbus, Ohio; Art Tebbe, Delphos, Ohio; W. G. Dotson, Badin, N. C. *Apology Department:* We reported Mr. John McMurray, of Indianapolis, Ind., as wrong. He was absolutely correct and his postmark was Nov. 22, which makes him runner-up to the winner. A box of cigars is on the way, Mr. MacMurray—and sorry. Winners to other puzzles next week.

New Puzzle:

A monument consists of two cubical blocks of granite, the smaller resting on the larger. The total height of the monument is 5 ft. and the area of the exposed surface is 61 square ft. Find the dimensions of the blocks. (This comes from Mr. Rice).

FREE



This Handbook of Industrial Porcelain Enamel

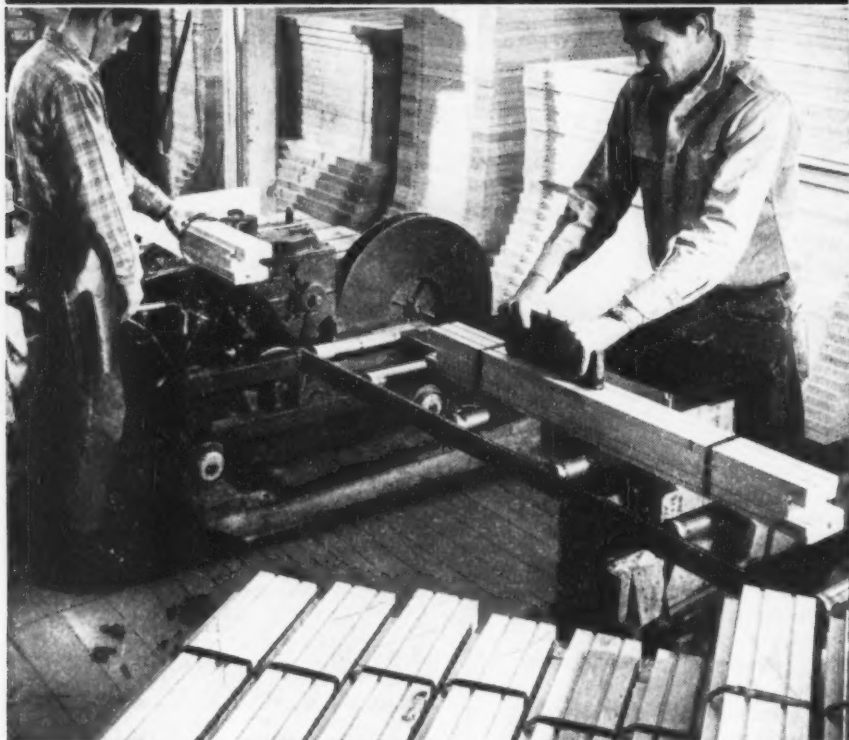
To aid you in solving industrial finishing problems, The Erie Enameling Company offers free of charge this detailed 16-page booklet on industrial porcelain enamel. It describes the various characteristics of porcelain enamel . . . presents proven examples of their effectiveness in industrial applications . . . provides basic information on how to design for porcelain enamel . . . tells you how to submit your finishing problem to Erie for expert analysis.

CLIP  MAIL

THE Erie ENAMELING COMPANY 1408 W. 20th St. INDUSTRIAL DIVISION ERIE, PENNSYLVANIA	
Please send me my free copy of "Porcelain Enamel to Handle the Tough Jobs."	
Name _____	
Firm _____	
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SLOWDOWN In Assembly?

Not when you bundle with a
SIGNODE
POWER STRAPPING MACHINE!



The happiest, most envied man on the production line—and the pace-setter—is the man on the *Signode Power Strapping Machine*! His job

is easy and light, and well-strapped bundles roll off the line automatically! But faster continuous output is not the only advantage gained.

Power Strapping Cuts Costs Also

Signode's Power Strapping Machine releases several men for other jobs. It does the job of bundling safe and faster, with uniform tension on every strap. The machine is flexible, handling packages of varying sizes without adjustment. It is highly adaptable, strap-

ping K.D. millwork, soft and hard wood flooring, shingles, crating lumber, expensive trim, etc. Strapped millwork and lumber is easier to handle, stack and tally. It can be loaded faster and enjoys protection from pilferage until used on the job.

Let's estimate your needs

Volume shippers usually have varying strapping needs. Let our fieldman survey your production layout and recommend the power

strapping machine for the job. You'll be under no obligation whatever. Write

*Another exclusive service proved and tested for you by Signode



SIGNODE

Steel Strapping Company
2623 N. Western Ave., Chicago 47, Ill.

this seal means security in shipping



Offices coast to coast.
In Canada: The Canadian Steel Strapping Co., Ltd.
Foreign Subsidiaries and Distributors World Wide

Conventions & Meetings

1953

Jan. 11-13—Institute of Scrap Iron & Steel, Inc., annual convention, Hotel Commodore, New York. Institute headquarters are at 1729 H Street, Northwest, Washington.

Jan. 12-13—Industrial Furnace Manufacturers Assn., Inc., midwinter meeting, Cleveland Hotel, Cleveland. Association headquarters are at 412 Fifth St., N.W., Washington.

Jan. 12-16—Society of Automotive Engineers, annual meeting and engineering display, Sheraton-Cadillac Hotel, Detroit. Society headquarters are at 29 W. 39th St., New York.

Jan. 13—Mining & Metallurgical Society of America, annual meeting, Mining Club, New York. Society headquarters are at 11 Broadway, New York.

Jan. 14-16—Compressed Air & Gas Institute, annual meeting, Dayton Biltmore Hotel, Dayton. Institute headquarters are at 122 E. 42nd St., New York.

Jan. 15-17—National Tool & Die Manufacturers Assn., winter meeting, Sorrento Hotel, Miami Beach, Fla. Association headquarters are at 907 Public Square Bldg., Cleveland.

Jan. 19-21—Hydraulic Institute, annual meeting, The Homestead, Hot Springs, Va. Institute headquarters are at 122 E. 42nd St., New York.

Jan. 21—American Boiler Manufacturers Assn. & Affiliated Industries, mid-winter meeting, Hotel Cleveland, Cleveland. Association headquarters are at 1571 W. 117th St., Cleveland.

Jan. 21-22—Steel Shipping Container Institute, winter meeting, Hampshire House and Hotel Pierre, New York. Institute headquarters are at 600 Fifth Ave., New York.

Jan. 21-23—Society of Plastics Engineers, Inc., annual meeting, Statler Hotel, Boston. Society headquarters are at 513 Security Bank Bldg., Athens, Ohio.

Jan. 22-23—Steel Plate Fabricators Assn., annual meeting, Palmer House, Chicago. Association headquarters are at 37 West Van Buren St., Chicago.

Jan. 26-27—Compressed Gas Association, Inc., The Waldorf-Astoria, New York. Association headquarters are at 11 W. 42nd St., New York.

Jan. 26-28—Truck Trailer Manufacturers Assn., annual convention, Edgewater Gulf Hotel, Edgewater Gulf, Miss. Association headquarters are at 1024 National Press Bldg., Washington.

Feb. 9-10—Multiple V-Belt Drive and Mechanical Power Transmission Assn., Hotel Statler, St. Louis, Mo. Association headquarters are at 27 East Monroe St., Chicago.

Feb. 16-19—American Institute of Mining & Metallurgical Engineers annual meeting, Statler Hotel, Los Angeles. Institute headquarters are at 29 W. 39th St., New York.

Mar. 2-6—American Society for Testing Materials, spring meeting, Statler Hotel, Detroit. Society headquarters are at 1916 Race St., Philadelphia.

Mar. 9-11—Manufacturing Standardization Society of the Valve & Fittings Industry, annual meeting, Commodore Hotel, New York. Society headquarters are at 420 Lexington Ave., New York.

3 POINTS TO REMEMBER

sodium hydride descaling is:

FAST-----



PRODUCTIVE-----



POSITIVE-----



Lower labor costs, higher production, faster, more positive processing. Small wonder more and more fabricators are turning to sodium hydride descaling.

This versatile process requires only minutes to descale a wide range of metals and alloys. The equipment you need is compact, space-saving . . . costs little to buy and maintain. There's no problem of acid waste disposal . . . no worry about metal pitting even after long exposure.

Like to know more about this most

advanced method and how you can install a descaling unit of your own? Ethyl's individualized technical service will help you. Our engineers consult with yours, make suggestions, recommendations, estimates, cooperate every way they can.

If you already have a unit, we offer you a continuing, dependable supply and prompt delivery of high quality sodium.

Either way, you'll find it profitable to mail the coupon . . . today.

For Titanium, Carbon and Alloy Steels, Stainless Steels, High Speed Tool Steels,
Cast Iron, Nickel, Inconel, Copper, Silver, Stellite.

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TULSA, MEXICO CITY AND (ETHYL ANTIKNOCK LTD.) TORONTO

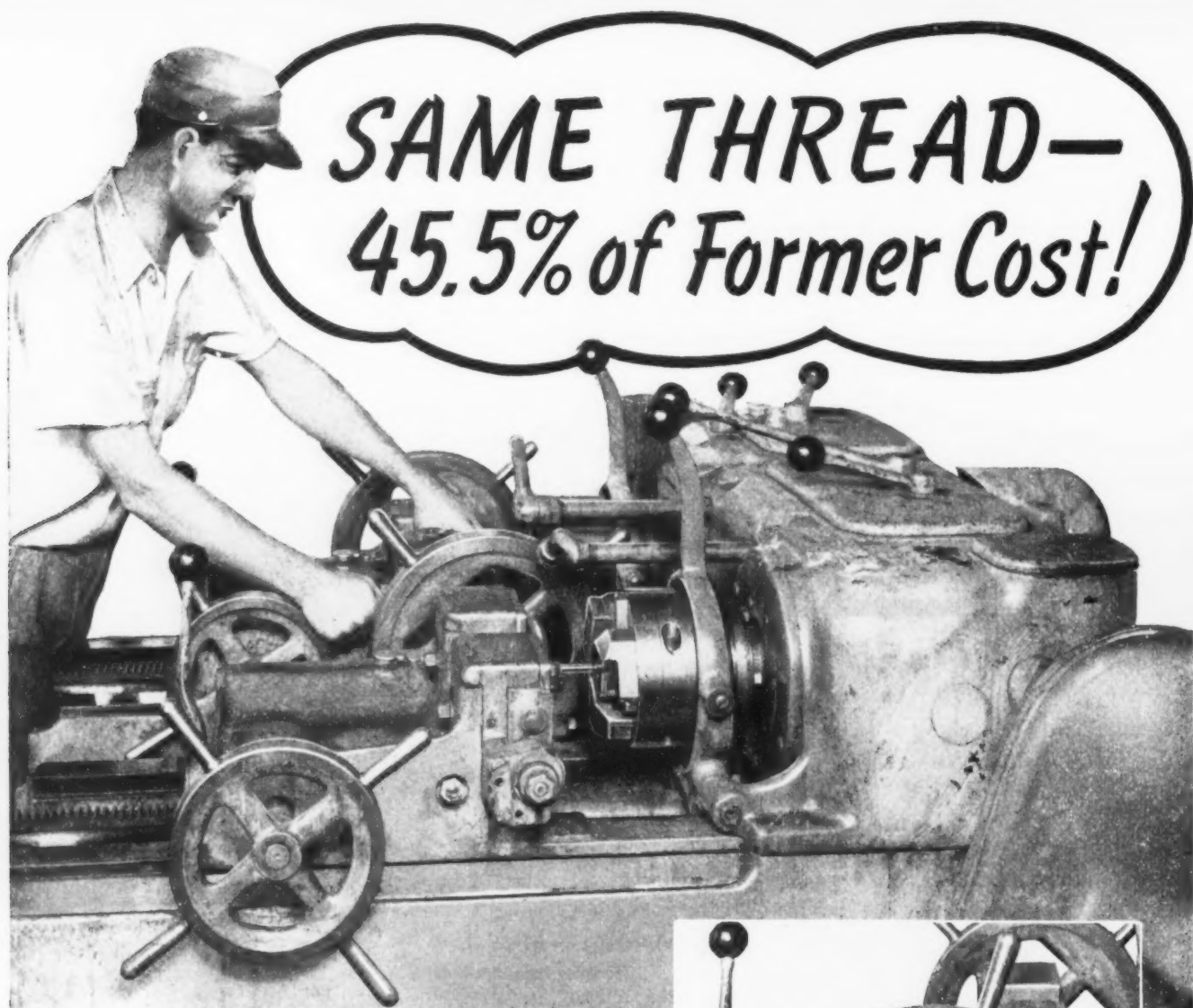


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100 Park Ave., New York 17, N.Y.

Please send me brochure on
Sodium Hydride Descaling
describing its uses, advantages,
typical reactions and
necessary equipment.

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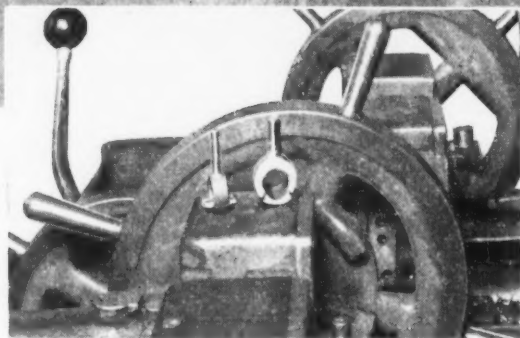
1A-12-18



Eye bolts, for use in the assembly of switchgears, are now threaded on 1" Double LANDMACO Leadscrew Threading Machines in the Philadelphia plant of a large Eastern manufacturer. Records show that costs by previous methods averaged 120% higher.

Three sizes of eye bolts are threaded from high tensile bronze and copper castings— $\frac{3}{8}$ ", $\frac{1}{2}$ ", and $\frac{5}{8}$ ". 16, 13 and 11 pitch National Coarse threads respectively are cut for lengths varying from $1\frac{7}{16}$ " to $1\frac{5}{8}$ " at cutting speeds of 302 and 217 RPM's.

Lower tool cost has been an important factor in the overall cost reduction from threading these parts with LANDIS Equipment. Approximately 25,000 pieces are produced between each regrinding of the chasers. This combined with the fact that LANDIS Chasers are reground and used for



most of their original length has brought tool cost down to a minimum.

This is one of many examples where LANDIS Threading Equipment has significantly reduced operating costs—others show increased production, better quality, lower maintenance, etc. Further information on LANDMACO Leadscrew Machines and all LANDIS Threading Equipment will be furnished promptly on request. Please give specifications when writing.

LANDIS Machine CO.

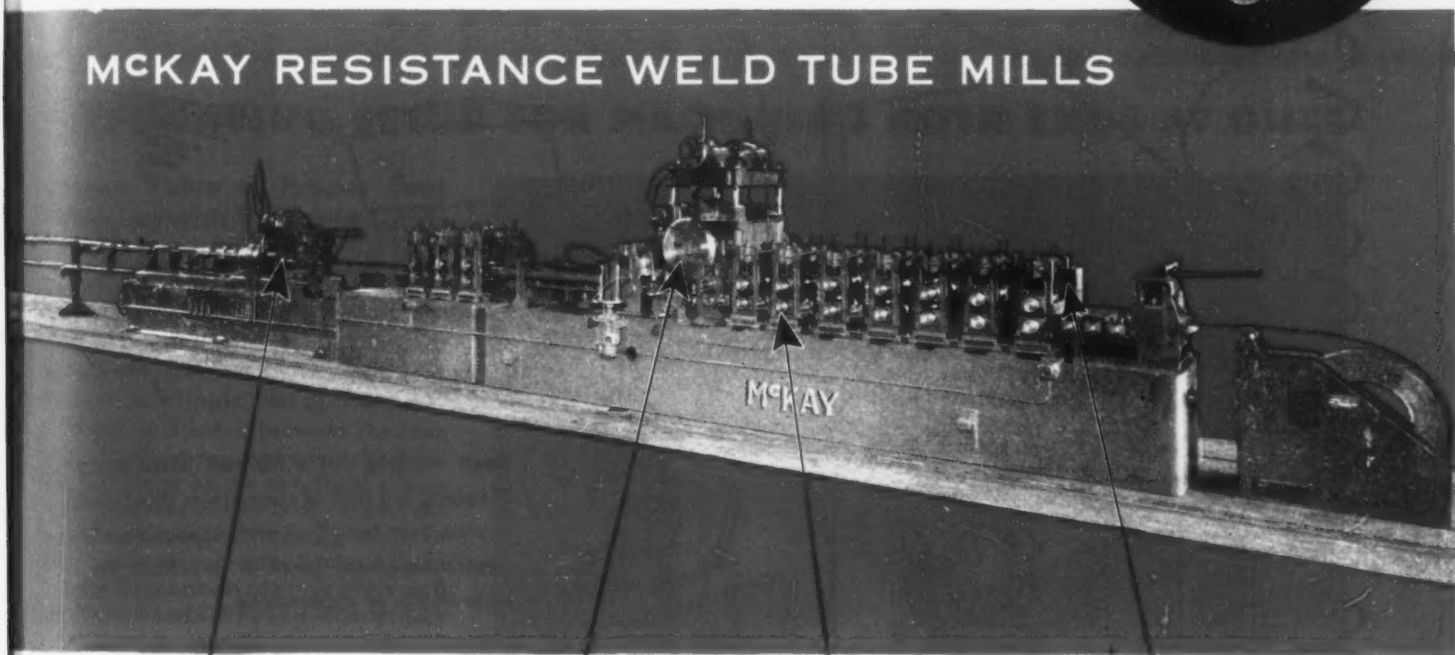


**WAYNESBORO
PENNSYLVANIA**

WHY DO MCKAY MACHINES REQUIRE

Less Maintenance?

MCKAY RESISTANCE WELD TUBE MILLS



CUT OFF
SYNCHRONIZED
WITH MILL SPEED
TUBING CLAMPED
BOTH SIDES OF
CUT

OIL-COOLED
COMPLETELY
SEALED ROTARY
TRANSFORMER
NO WATER NEAR
HIGH VOLTAGE

ALL SHAFTS
ALLOY STEEL
HEAT TREATED
ANTI-FRICTION
BEARINGS
THROUGHOUT

ALLOY GEARS
FORCE
LUBRICATED
NO OVERHUNG
GEARS
ALL MAIN ROLLS
DRIVEN

McKay offers a complete line of Resistance
Weld Tube Mills for producing
from $\frac{3}{8}$ " dia. tube to line pipe.

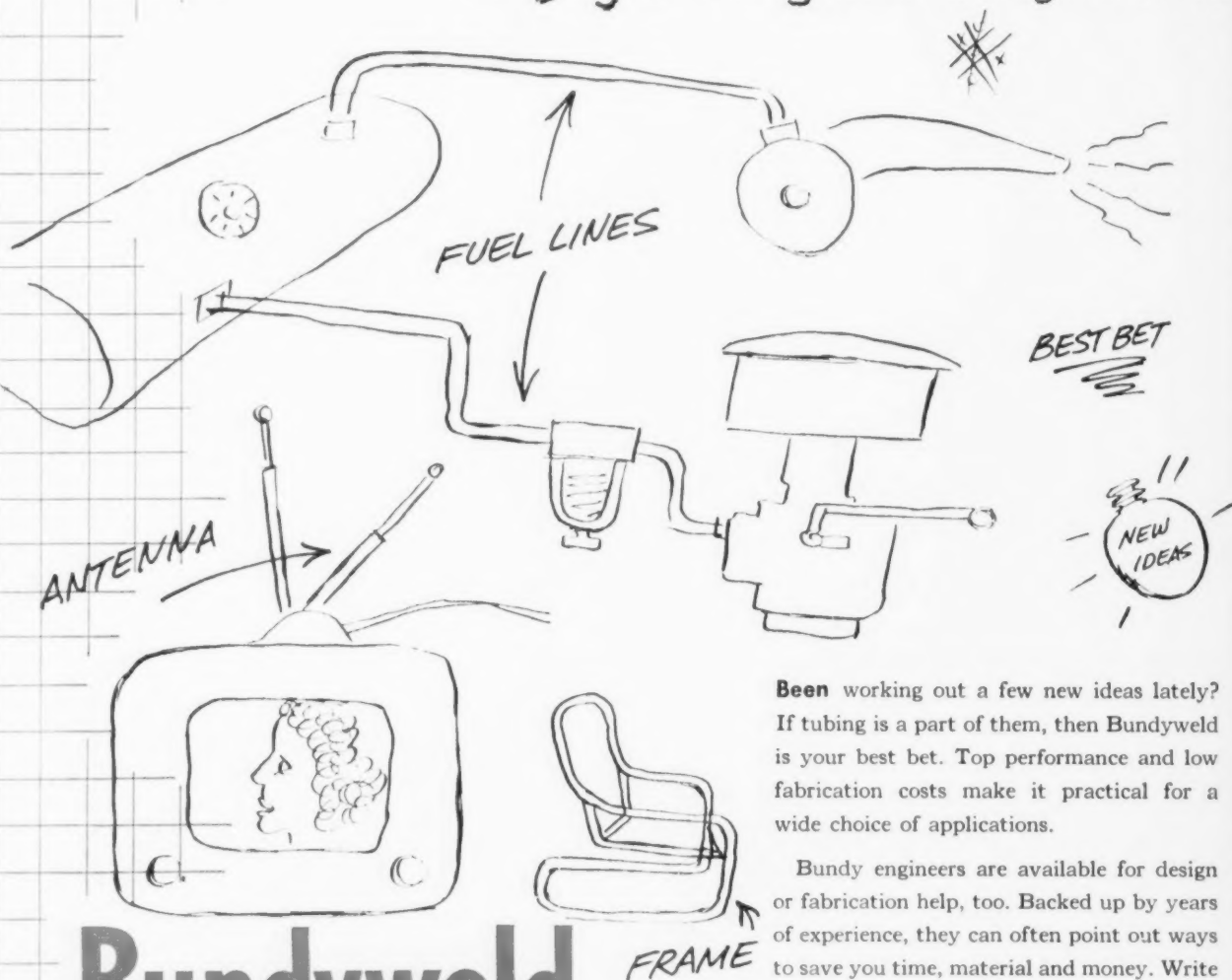
McKay McKrometer adjustment of roll pressures
facilitates set ups and speeds change over.

Mail your inquiries to
McKay Machine Co., Youngstown 10, Ohio



Bundyweld "Doodles"

to jog a designer's imagination



Bundyweld Tubing

DOUBLE-WALLED FROM A SINGLE STRIP

Leakproof
High thermal conductivity
High bursting strength
High endurance limit
Extra-strong
Shock-resistant
Ductile

Lightweight
Machines easily
Takes plastic coating
Scale-free
Bright and clean
No inside bead
Uniform O.D., I.D.

Been working out a few new ideas lately? If tubing is a part of them, then Bundyweld is your best bet. Top performance and low fabrication costs make it practical for a wide choice of applications.

Bundy engineers are available for design or fabrication help, too. Backed up by years of experience, they can often point out ways to save you time, material and money. Write for a catalog today.

Bundy Tubing Company, Detroit 14, Michigan.

WHY BUNDYWELD IS BETTER TUBING



Bundyweld starts as a single strip of copper-coated steel. Then it's . . .



continuously rolled twice around laterally into a tube of uniform thickness, and



passed through a furnace. Copper coating fuses with steel. Result . . .



Bundyweld, double-walled and brazed through 360° of wall contact.



SIZES UP TO 1/4" O.D.

NOTE the exclusive patented Bundyweld beveled edges, which afford a smoother joint, absence of bead and less chance for any leakage.

Bundy Tubing Distributors and Representatives: Cambridge, 42, Mass.: Austin-Hastings Co., Inc., 226 Binney St. • Chattanooga 2, Tenn.: Peirson-Deakins Co., 823-824 Chattanooga Bank Bldg. • Chicago 32, Ill.: Lapham Hickey Co., 3333 W. 47th Place • Elizabeth, New Jersey: A. B. Murray Co., Inc., Post Office Box 476 • Philadelphia 3, Penn.: Rutan & Co., 1717 Sansom St. • San Francisco 10, Calif.: Pacific Metals Co., Ltd., 3100 19th St. • Seattle 4, Wash.: Eagle Metals Co., 4755 First Ave. South Toronto, Ontario, Canada: Alloy Metal Sales, Ltd., 181 Fleet St., E. • Bundyweld nickel and Monel tubing is sold by distributors of nickel and nickel alloys in principal cities.

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Production Pointers

from

GISHOLT



TIME-
SAVING
IDEAS



Presented as a service to machine shops, we hope some of these interesting ideas, culled from thousands of jobs, will suggest ways to help you cut time and costs in your own metal work.

COST-SAVING SETUP FOR MACHINING BOTH ENDS AT ONCE

Shows Value of Proper Tool Planning with Versatile Lathe

You can see real thinking has gone into this setup for machining tractor rear axle housings. As the result, this Simplimatic Automatic Lathe is simultaneously machining the two end flanges in a single, fast operation.

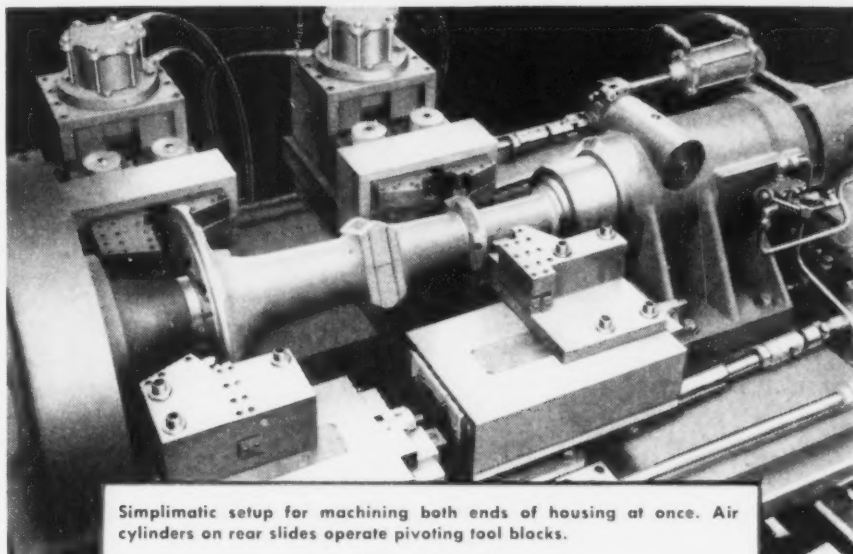
Work is divided between the four slides. All turning and some chamfering are done by the two front slides. The two rear slides take care of the straddle facing . . . doing it in an extremely clever way. Each of these rear slides consists of a pair of pivoted tool blocks which have a scissors-like action.

Tool Blocks have Two Sections

The two *right* rear tool blocks are tightly wedged together at the start of the cut. When straddle facing is completed they spring apart, providing tool relief for the withdrawal.

There's a different action to the two *left* rear tool blocks. Here, the tool blocks are partially wedged together as the slide feeds the tools into the work. As the slide continues to feed forward, the straddle facing tools are brought closer together. This splits the wide facing cut among three tools. At the completion of the cut, the tools spring apart for tool relief. Floor-to-floor time for the entire automatic operation is 1.33 minutes.

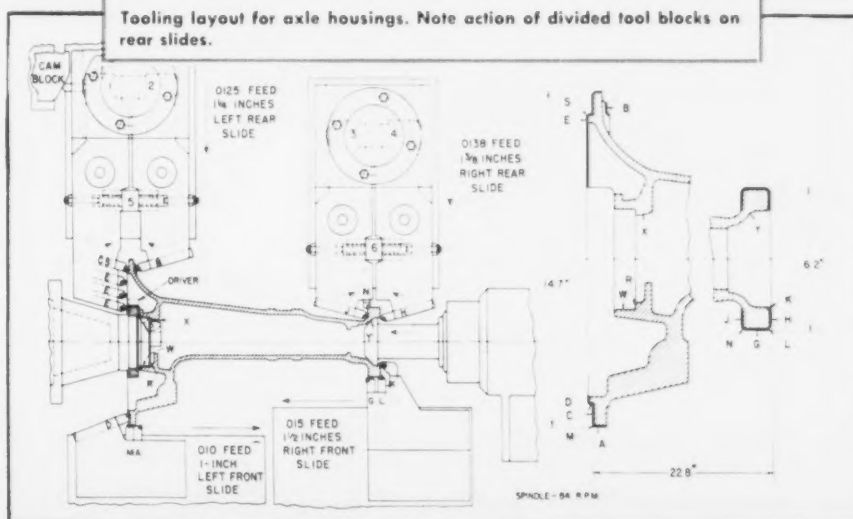
Pivoting tool blocks on this Simplimatic job provide the answer for machining both flanges in a single operation.



Simplimatic setup for machining both ends of housing at once. Air cylinders on rear slides operate pivoting tool blocks.



Tooling layout for axle housings. Note action of divided tool blocks on rear slides.



Other interesting jobs . . . handled on the Simplimatic Automatic Lathe, plus full information and specifications are yours in the all new Simplimatic catalog just off the press. Ask for your copy.



**TIME-
SAVING
IDEAS**

AUTOMATIC LATHE TURNS OUT PARTS IN PAIRS

Tooling Arranged for Handling Related Parts with One Setup

Here's a 1F Faster-matic Automatic Turret Lathe specializing in the production of a wide assortment of mating parts. The steel forgings are handled in lots of 200 pieces—100 male and 100 female parts.

Simple tooling takes care of the simple operations involved. Just two faces of the hexagon turret are needed for each part . . . but the handling of alternate male and female parts keeps four turret stations busy.

The photo shows a male flange being formed. This is followed by a drilling operation. After that, the operator removes the male flange and chucks a female flange (using same chuck jaws). Passing the next turret face, work is then begun on this flange. From stations four and five the female flange is drilled and faced. Turret station six is then passed and the operation is complete . . . and a male flange is again handled.

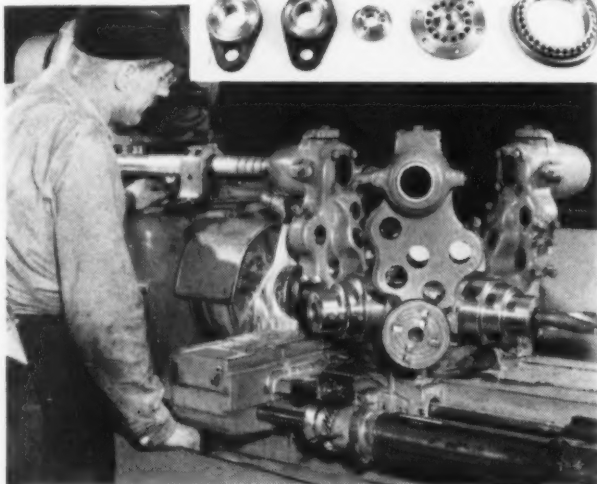
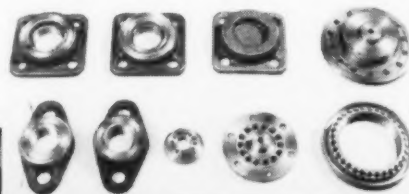
The nice feature of this setup is that with one set of tools on the machine,

you complete *two* mating parts. This way you're always sure the parts will match perfectly. Moreover, since alternate pieces are machined, there's no problem in keeping quantities even. Total time for a pair of these parts is an even 5 minutes.

Small parts, even in small lots, are economically produced in pairs by the Faster-matic Automatic Lathe.

Male flange being formed. After next drilling operation, female flange is machined. Then male flange again.

Typical parts handled in pairs on the Fastermatic.



PISTONS BORED AND CENTERED IN 1ST OPERATION

No. 12 Hydraulic Automatic Lathe Combines Machining of Skirt and Centering of Dome

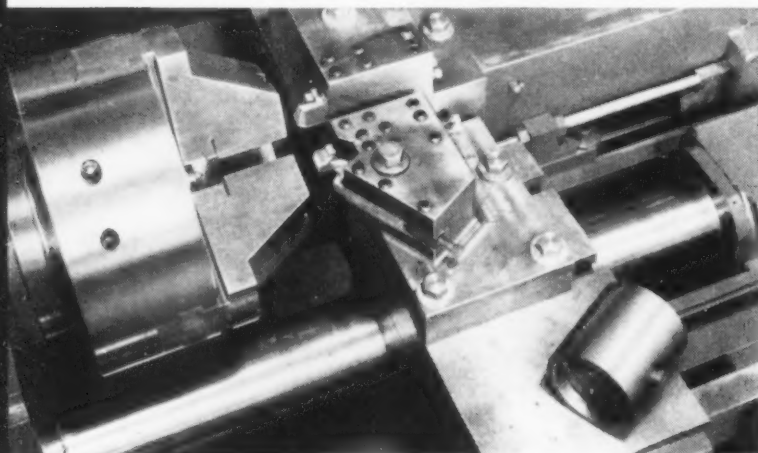
The main operations are on the skirt end of this cast iron tractor piston. The rear slide feeding longitudinally rough bores and faces the skirt. As

this slide withdraws, the front carriage moves longitudinally to finish bore and chamfer the ID. It then swings in to finish face and chamfer the OD. It is then withdrawn from the position to provide tool relief.

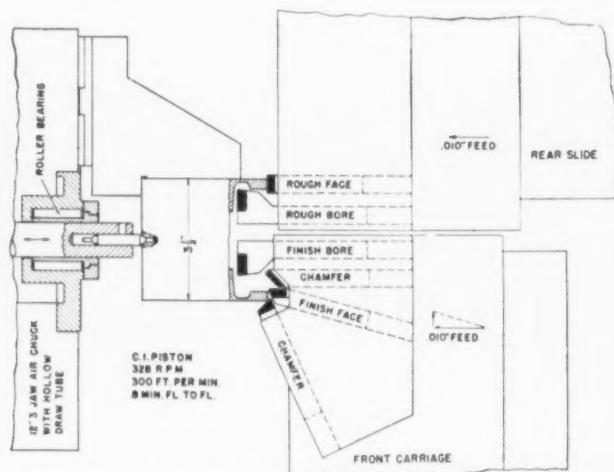
After operations on the piston skirt, the No. 12 Hydraulic completes its job by centering the piston dome. This is handled by the back boring

attachment in the spindle. Floor to floor time is .8 minute. Several sizes of pistons are handled by this No. 12 Hydraulic, all with fully automatic operation.

Combining boring of skirt and centering of dome saves time and provides complete concentricity for following machining operations.



Close up of Tooling for boring and facing skirt end of piston and centering dome end.



Cast iron tractor piston job on the No. 12 Hydraulic Automatic Lathe.



LOOK AHEAD... KEEP AHEAD... WITH GISHOLT



TIME-
SAVING
IDEAS

EASY DOES IT...WITH A 6-SPEED CHANGE OF PACE

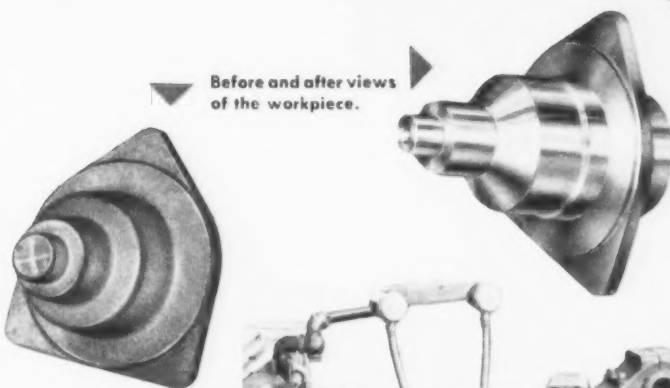
Saddle Type Turret Lathe Cuts Time Lag with Speed Selector

While the operations needed to finish these spindles are all relatively simple, the job could be a trouble-maker on a less able machine than this 2L Saddle Type Turret Lathe.

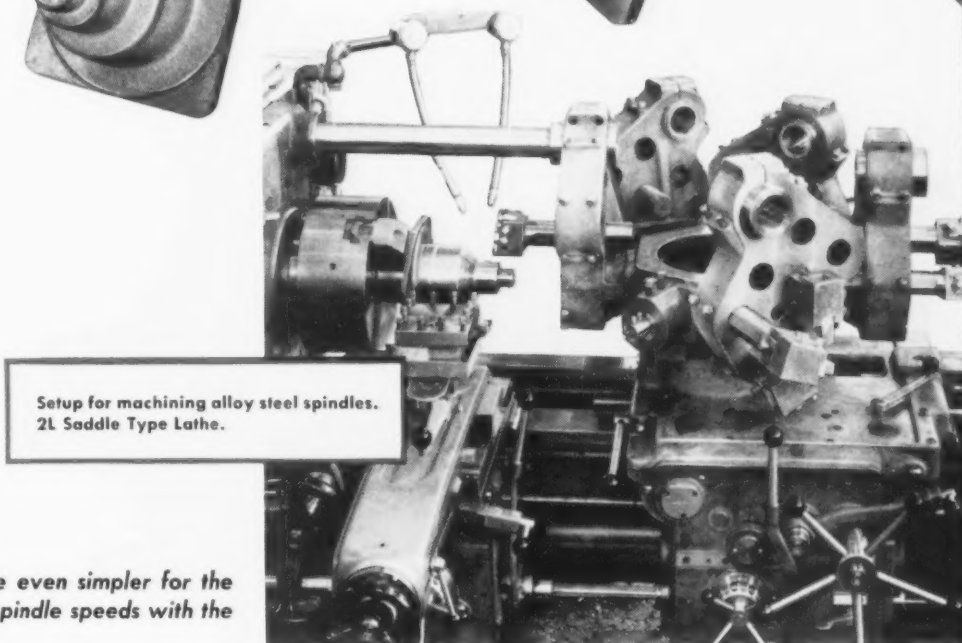
Here's why: The part's a tough steel forging weighing in at 103 lbs. and finishing at 93 lbs. Not much stock removed, to be sure, but it takes carbide to do it. The workpiece is chucked on the previously turned short rear hub with a standard 3-jaw airchuck to speed up handling. Standard tools are used to finish all twelve outside diameters.

With the many diameters to be machined on the part, six different spindle speeds are required . . . an easy matter for the Gisholt with its Hydraulic Speed Selector which gives instant, accurate speed changes. Floor-to-floor time for these husky parts is an easy 14.5 minutes.

Simple operations on these parts are made even simpler for the operator because of the ease of changing spindle speeds with the Gisholt Hydraulic Speed Selector.



Before and after views of the workpiece.



Setup for machining alloy steel spindles. 2L Saddle Type Lathe.

A LITTLE EXTRA TOOLING—A LOT OF EXTRA PRODUCTION

Ram Type Turret Lathe Completes Pulleys in Single Chucking

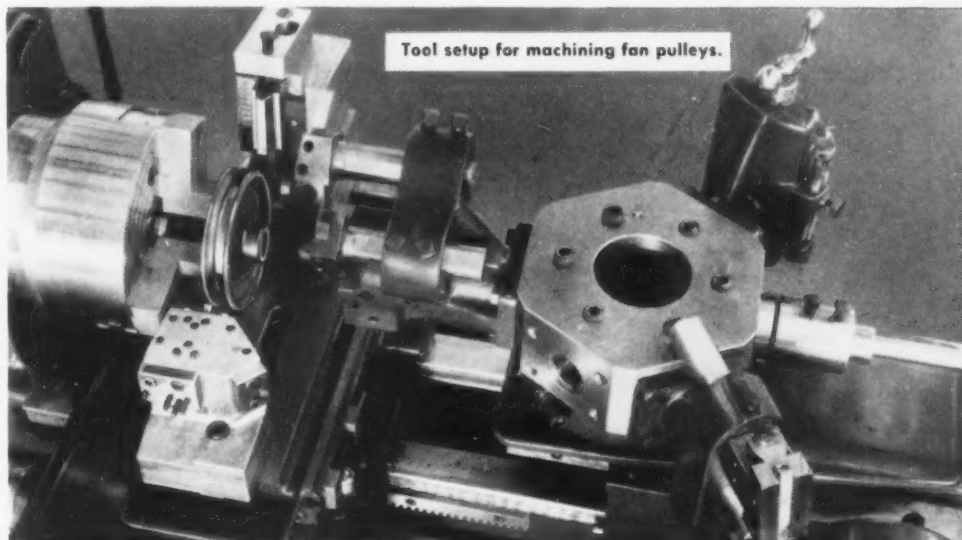
Here's another example of where careful attention to tooling is paying off in increased production. The part is a V-belt pulley and the machine is a standard No. 3 Ram Type Turret Lathe.

The part is held in special top jaws on a standard Gisholt 3-jaw scroll chuck. All boring, turning and facing of the hub are handled by multiple tooling on three faces of the hexagon turret. The large OD is also turned from here.

Special tools are used on the cross slide. In place of the standard quick-indexing tool post on the front of the slide, there is a special tool block. These tools not only rough out the groove, but straddle face the sides as well.

On the rear of the cross slide is another special tool block. Tools here finish-form the groove and finish-straddle face the flanges.

By using special tool blocks on both the front and rear of the cross slide, all machining on these pulleys is done in one chucking.



Tool setup for machining fan pulleys.





TIME-
SAVING
IDEAS

TAKING THE TROUBLE OUT OF TAPPETS ... WITH SUPERFINISH

9 Spindle Superfinisher Does High Volume Work

Here's another forward step for extending and improving engine performance. This time it's valve tappets that are being Superfinished. Doing this high production job is a Model 53A Superfinisher. Here's how it operates:

The machine has nine spindles in a rotating base. This operates continuously, like a "merry-go-round." Each work spindle has a collet to hold the tappet. Above is a Superfinishing head. Collets and heads rotate in opposite directions. During the machine cycle the flat Superfinishing stones scrub off the amorphous metal on the cam surface of each tappet.

Superfinishing complete, the head is raised and an angular head comes in to chamfer the corners. Then, as the spindle returns to the unloading position, rotating stops, the collet opens, and the tappet is partially ejected. The operator then takes out

Superfinisher produces 600 to 800 finely finished valve tappets per hour.

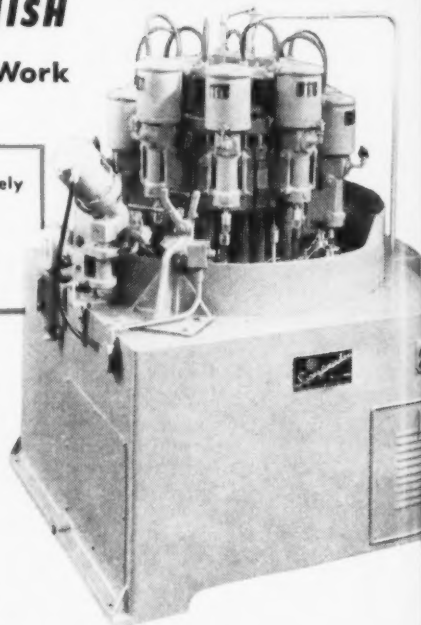
★ ★ ★

Close-up showing special Superfinishing unit for chamfering OD of tappets.



the finished tappet and replaces it with an unfinished tappet. Production is 600 to 800 parts per hour.

Superfinishing is solving "wearing" problems in many industries.



The textbook "Wear and Surface Finish" gives the complete story. Ask for your copy.

Better, longer lasting valve tappets are produced in this high production Superfinishing setup.

FLYWHEELS IN ALL SIZES BALANCED ON THIS ONE MACHINE

Handled on Efficient Production Basis

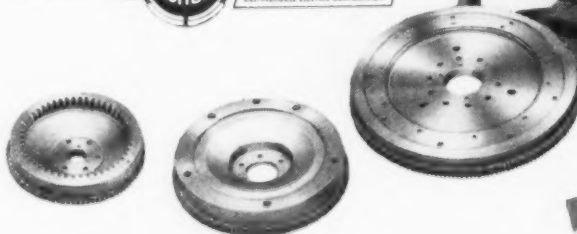
Here is the way flywheels in a large variety of sizes are balanced by a well known engine manufacturer. A Gisholt DYNETRIC Type UV1 Balancing Machine takes care of all production, with parts weighing from 25 to 400 lbs.

A roller and guide arrangement, adjustable to handle flywheels from 8½" to 32", carries the flywheels from the assembly line to the machine and back. As the flywheel is located in position on the Balancer, a hydraulically operated mechanism raises it from the rollers for support by the spindle.

After the quick balancing operation is completed, the flywheel is turned to the indicated angle of unbalance. A sliding prick-punch, which

can be set at any radius from 4" to 16" from true center, is then moved to the proper location and activated to mark the spot on the flywheel bottom where drilling correction is made.

This balancing operation, which is part of assembly line operations, results in smoother engine performance, less engine vibration.



Type UV1 Balancer for balancing tractor engine flywheels.

A few of the many sizes of flywheels balanced.



No 11-1252

603



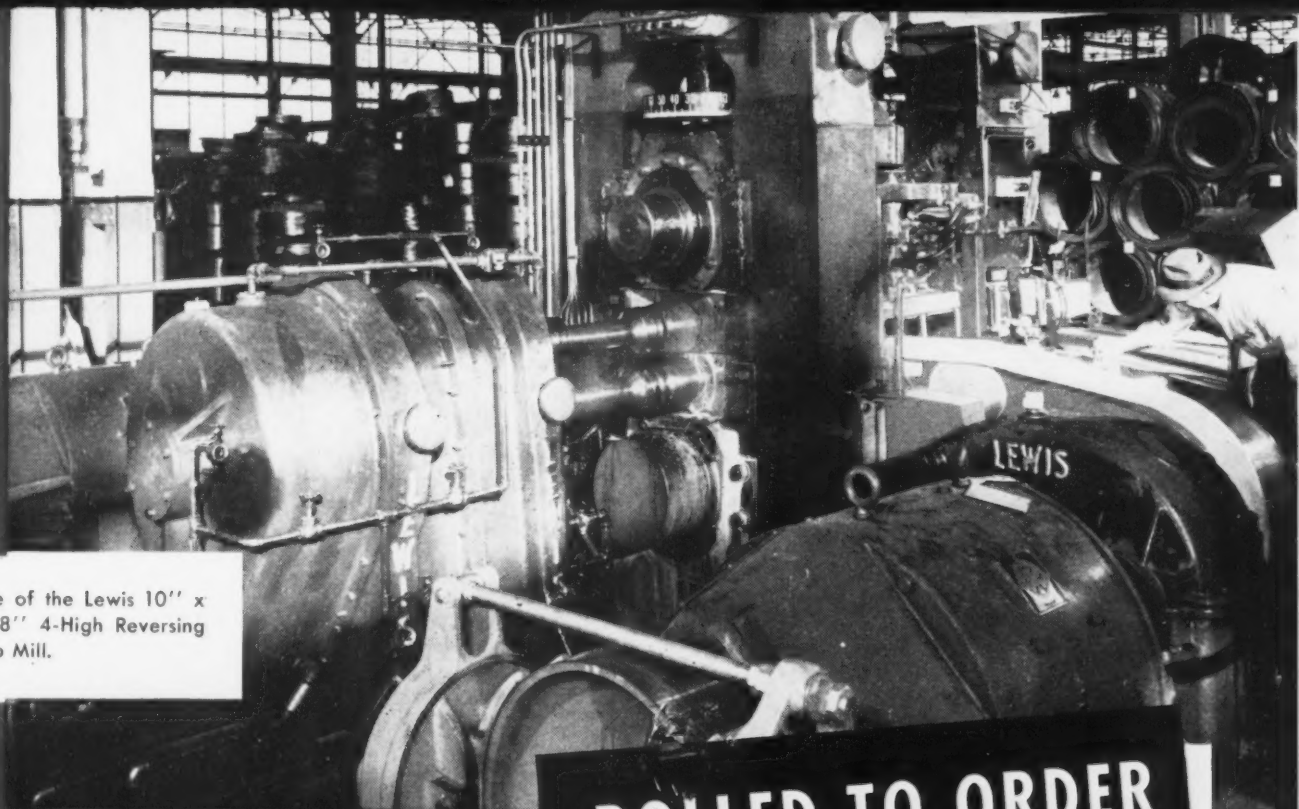
THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT

MACHINE COMPANY

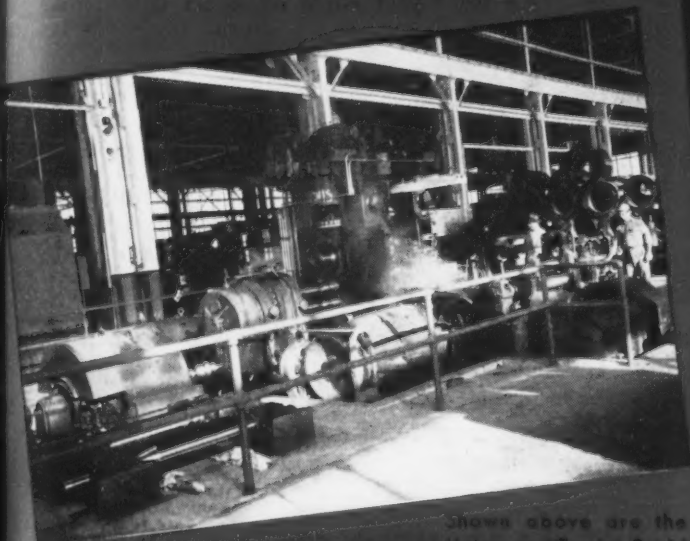
Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES



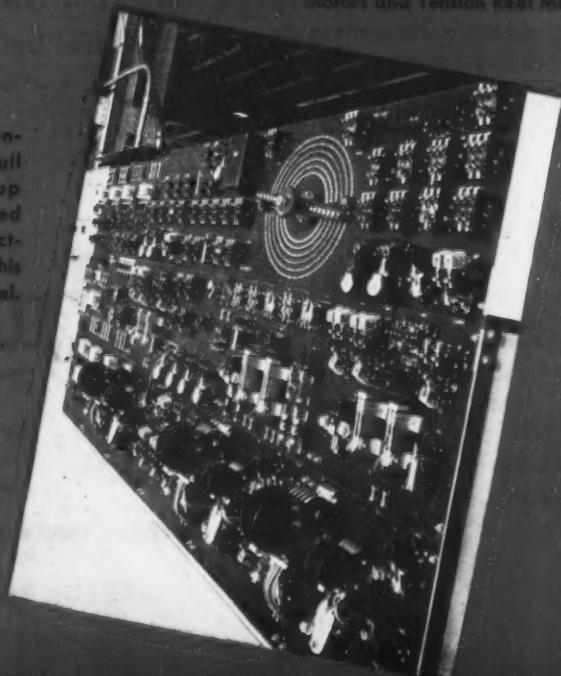
Entry side of the Lewis 10' x 20' x 28' 4-High Reversing Cold Strip Mill.

ROLLED TO ORDER —to Your Specifications



Shows above are the Mill Motors and Tension Reel Motor.

Constant tension over full coil build-up and Mill speed range is effected through this Control Panel.



When Production Steel Coil Co. Inc. gets a request for cold rolled strip of unusual width, gauge, temper and finish, they don't put the customer off with a "not in stock" excuse. They roll the order to exact specifications right in their Detroit warehouse on a Lewis 10' x 20' x 28' 4-High Reversing Cold Strip Mill! Reversing coils permit continuous operation with substantial reductions per pass, and close gauge tolerances are maintained with the most advanced pushbutton controls. This mill, together with its annealing equipment provides an exceedingly flexible arrangement that meets all customers' requirements. Write for complete technical details.

Manufacturers of Rolls and Rolling Mill Equipment For the Iron, Steel and Non-Ferrous Industries

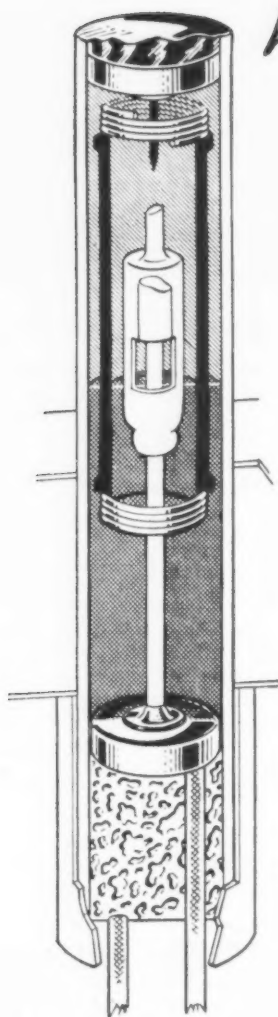


FOUNDRY & MACHINE

Division of Blaw-Knox Company
Pittsburgh, Pa.

Mercury Relay Stainless Tubing Specifications:

Type 304: Super Finish on ID
 OD tolerance $\pm .003''$
 ID tolerance $+.000''$
 $-.006''$



Super finish needed on the inside, to permit ID broaching without so much as a scratch or a pinhole! Tolerances have to be held just right on tube after tube after tube!

Right there you have this manufacturer's reason for specifying *Carpenter Stainless Tubing* over a long period of years.

When you have a Stainless Tubing problem that requires something extra in mill experience and product quality, it will pay you to get in touch with Carpenter. Let us work with your engineers in the development of your future products.

Slide Chart on Bending Stainless Tubing gives recommended bending radii and coil diameters for various sizes and gauges. To get good results on bending jobs and avoid waste of critical material, write for your copy.



THE CARPENTER STEEL COMPANY

Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter

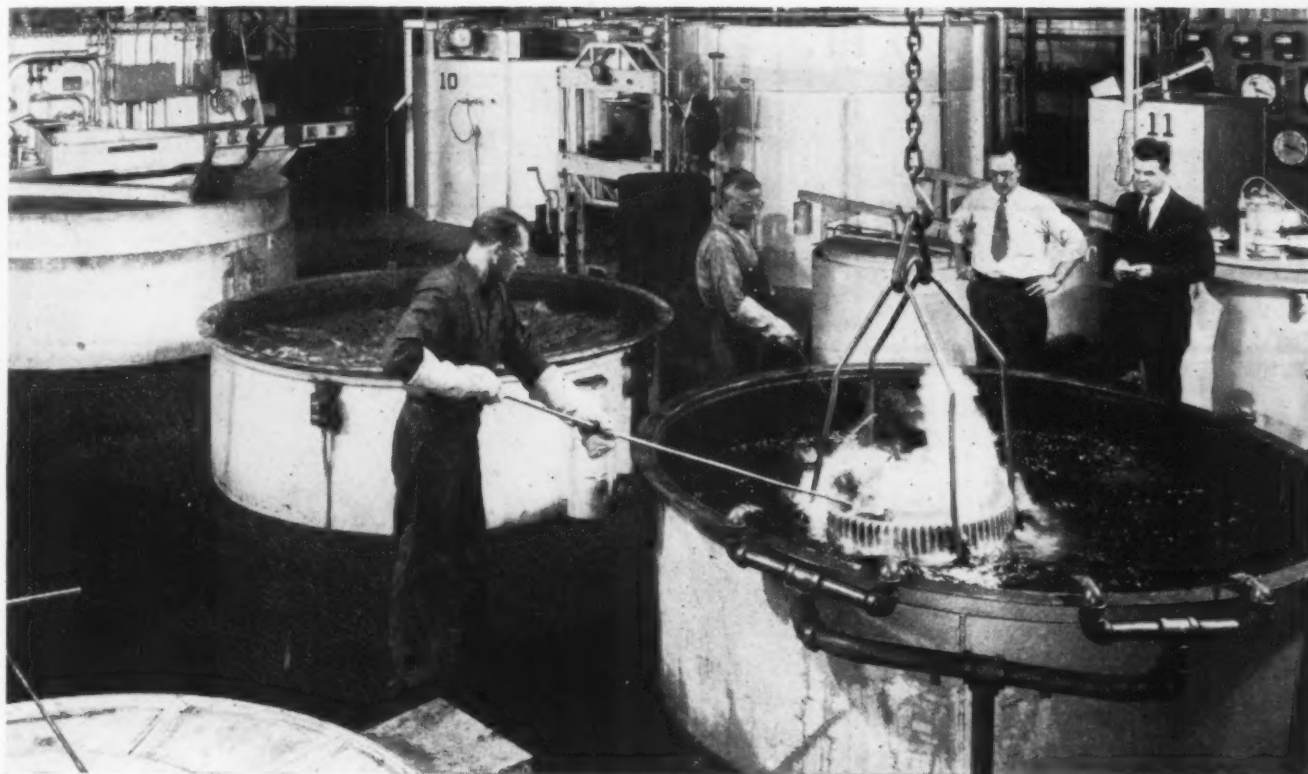
STAINLESS TUBING



—guaranteed on every shipment



Want deeper hardness on low alloy steels without distortion or cracking?

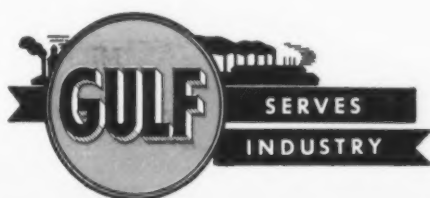


➔ *switch to* **GULF SUPER-QUENCH**

GULF SUPER-QUENCH is exceptionally fast — produces deep and uniform hardness on all types of alloy steels. Deeper and more uniform than is possible with conventional quenching oils. It is particularly effective on the substitute steels which have low hardenability characteristics.

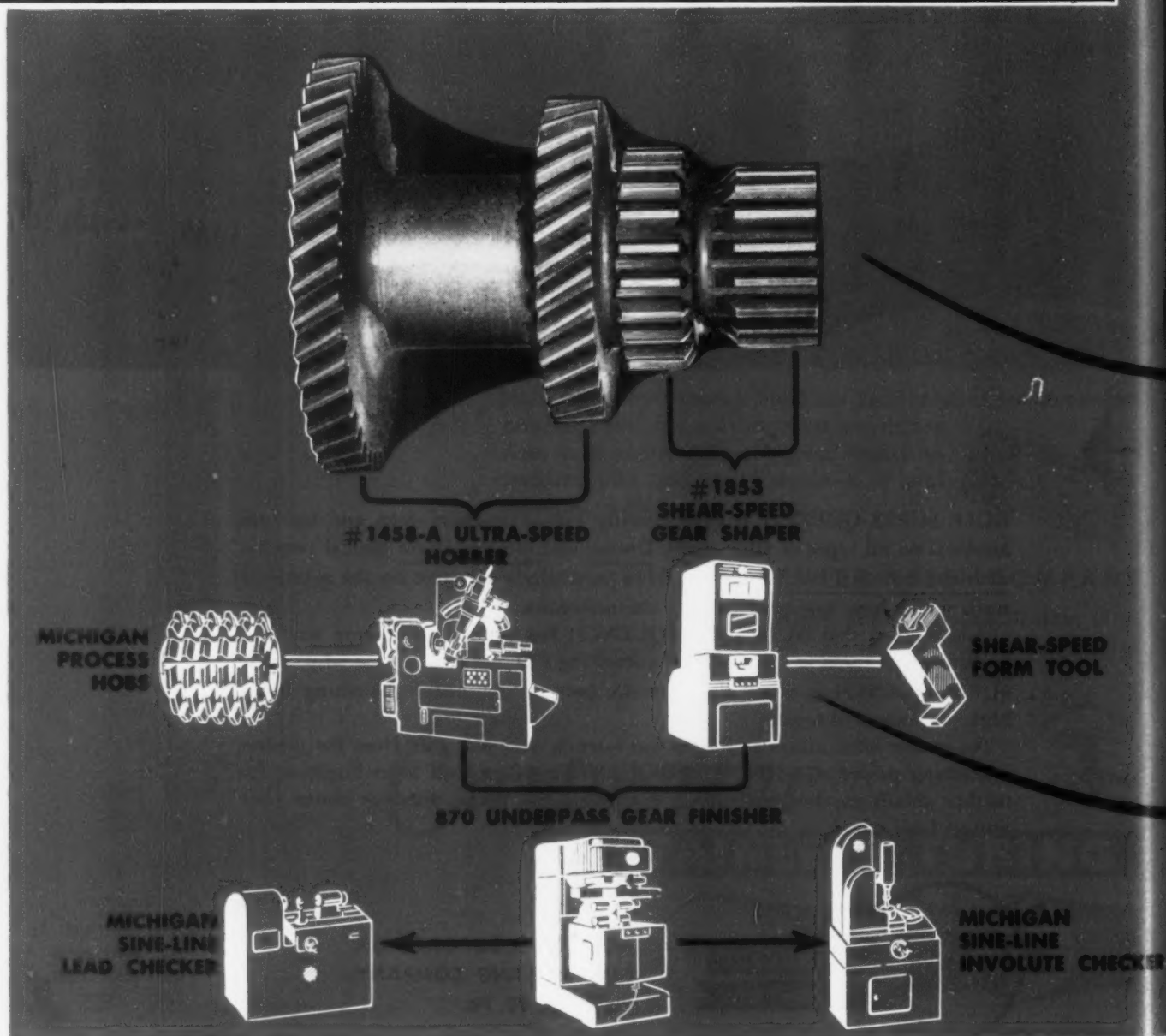
Add the fact that GULF SUPER-QUENCH has the same minimum tendency to distort and crack as conventional quenching oils and you can see why GULF SUPER-QUENCH is often the difference between successful quenching and a high percentage of rejects.

No matter what alloys or shapes you quench, you will gain from the greater quenching power of GULF SUPER-QUENCH. Ask a Gulf Sales Engineer for further details on this outstanding quenching oil. Write, wire, or phone your nearest Gulf office.



GULF OIL CORPORATION
GULF REFINING COMPANY
Pittsburgh 30, Pa.

40 tooth 8 NP 5¾" P.D. ⅞" face	31 tooth 8 NP 4½" P.D. 1" face	21 tooth 7/9 pitch 3" P.D. 1" face	17 tooth 7/9 pitch 2½" P.D. 1¼" face	(as shown below) gear	
81 seconds	67 seconds	38 seconds	48 seconds	Estimated cutting time	cutting
32/hr.	37/hr.	56/hr.	48/hr.	Gears / hr. at 85% eff. per machine	
60 seconds	50 seconds	48 seconds	45 seconds	Estimated cutting time	finishing
41/hr.	47/hr.	48/hr.	51/hr.	Gears / hr. at 85% eff. per machine	



**YOU CAN GET
PRODUCTION
LIKE THIS**

**ON GEARS
LIKE THESE**

**TOOLED
WITH THESE
MACHINES**

**THE TIME TO PLAN YOUR
GEAR PRODUCTION**

The best gears are produced at the lowest cost when (a) each production step is tooled for maximum efficiency and (b) all steps of the line are properly "coordinated"—from blank to finished gear.

That is where Michigan Tool Company comes in.

That is why we have developed so complete a line of gear production equipment—machines and tools for practically every step, including gear cutting, finishing and control of quality.

We would like to help you improve your "line coordination," help you cut costs and rejects, increase output per machine and man hour, improve quality.

An invitation from you to have one of our engineers visit your plant and discuss your plans and problems with you will be appreciated.

May we hear from you?



**MICHIGAN TOOL
Company**

7171 E. M. NICHOLS RD. • DETROIT 12, MICHIGAN, U. S. A.





"It's foolish to try to be bigger than you are"

REMEMBER Aesop's fable of the frog and the ox? Told 2,500 years ago, it goes:

"Three young frogs cried to their mother that a little brother had been trampled by the largest beast in the swamp. 'Oh, no,' said the mother, 'no beast is larger than I.' And she blew herself up to show how big she really was. 'But it was much bigger,' the little ones chorused. Whereupon the vain mother inflated herself until she burst." And the moral was, "It's foolish to try to be bigger than you are."

Aside from the wisdom of the fable for each of us individually, there is solemn warning for us as a nation. Some among us seem to believe that with an unlimited supply of taxpayers' dollars America can buy anything--ease and

security at home, acceptance of our ideas abroad, friendship of other peoples, even world peace.

Like the vain frog, America inflates herself more and more dangerously, trying to stretch herself to be the biggest thing in the swamp. Meanwhile the enormous beast that is the world goes its own way, scarcely affected by the vain-glorious display of America's inflation. It's the same old world that was indifferent before the pomp of Egypt, Persia, Greece and Rome.

How will our present "puffing" end? Isn't it obvious that continued inflation can bring disaster? Only by a realistic policy of living within our means--not trying to be bigger than we are--can America avoid the catastrophe of Aesop's foolish frog.



The Youngstown Sheet and Tube Company

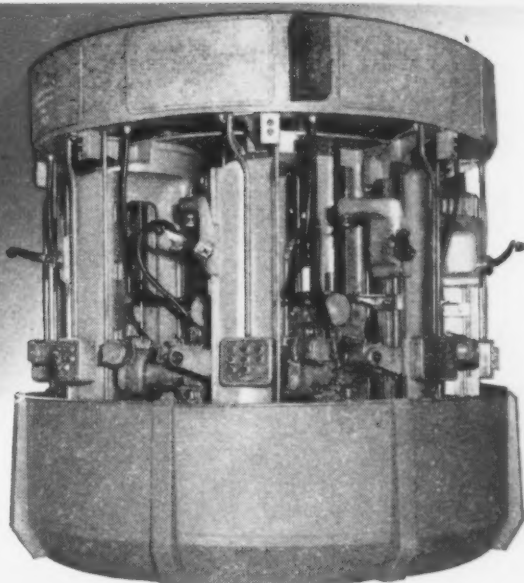
General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

RAILROAD TRACK SPIKES • CONDUIT • HOT AND COLD FINISHED CARBON AND ALLOY BARS • PIPE AND TUBULAR PRODUCTS • WIRE • ELECTROLYTIC TIN PLATE • COKE TIN PLATE • RODS • SHEETS • PLATES.

12,750

SPROCKETS



*all in a day's work**

WITH THE LEES-BRADNER MODEL 7-A 8-SPINDLE HOBBER

● Sprockets, sprockets, sprockets! Imagine 12,750 precision-made sprockets a day . . . that's the amazing capacity of the Lees-Bradner Model 7-A 8-Spindle Automatic Hobber.

These are center guide sprockets. They are 3" in diameter, have 19 teeth each, and are made from SAE 1040 steel. Close tolerances are mandatory because the sprocket is used in the timing mechanism of an automobile engine.

The simplicity, ruggedness and ease of operation of the 7-A have made it first choice in high production plants. Automatic push-button controls make it possible for even unskilled workers to set production records.

Your Lees-Bradner representative will be happy to give you all the facts on the Model 7-A 8-Spindle, 6-Spindle, 4-Spindle or Single Spindle Hobbers. Call him or write us for his name and address.

PRODUCTION FACTS

1/2" pitch chain sprocket
19 teeth
SAE 1040 steel
Hob diameter: 4"
No. of starts in hob: 2
Hob speed: 230 RPM
Feed: .060

*Running at 100% efficiency on 3 8-hour shifts.

the **LEES-BRADNER** *Company*
CLEVELAND 11, OHIO, U.S.A.



Now .. Microfin

HERE'S POSITIVE PROOF

Results from two of many field tests:

TURNING #5665 NICKEL ALLOY

Old Method — 120 grit Diamond wheel
finish—average 12 pieces

New Method — Behr-Manning 220 grit
Carbide Tool Finishing
Belt — average 34 pieces

TURNING STAINLESS STEEL VALVES

Old Method — 100 grit Diamond wheel
finish—average 400 pieces

New Method — Behr-Manning 220 grit
Carbide Tool Finishing
Belt—average 735 pieces

HERE'S THE COMBINATION THAT DOES IT



finish your carbide tools without **DIAMOND WHEELS**

**Great new abrasive belt finishing development
by Behr-Manning and Fenlind Engineering Co.**

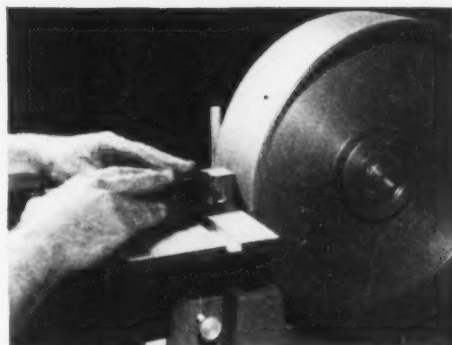
This entirely new method of micro-finishing carbide turning tools with economical abrasive paper belts, not only saves the high cost of diamond wheels, but also greatly extends the cutting service life of the tools. In addition, the method gives a superior micro-finish — "glacier-cold" edge. No time-consuming diamond hand honing required.

TEST YOUR TOOLS IN YOUR OWN PLANT

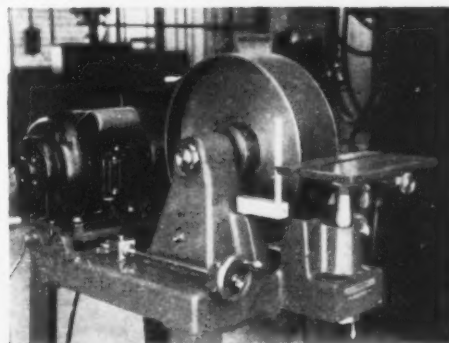
Without obligation, we'll micro-finish your carbide turning tools to your specifications by the new method at BEHR-MANNING, Troy, N. Y., or at any of the following BEHR-MANNING Demonstration Rooms:

BOSTON
BUFFALO
CHICAGO
CINCINNATI
CLEVELAND
DETROIT
GRAND RAPIDS
HIGH POINT

INDIANAPOLIS
LOS ANGELES
NEW YORK
PHILADELPHIA
PITTSBURGH
ST. LOUIS
SAN FRANCISCO
SEATTLE



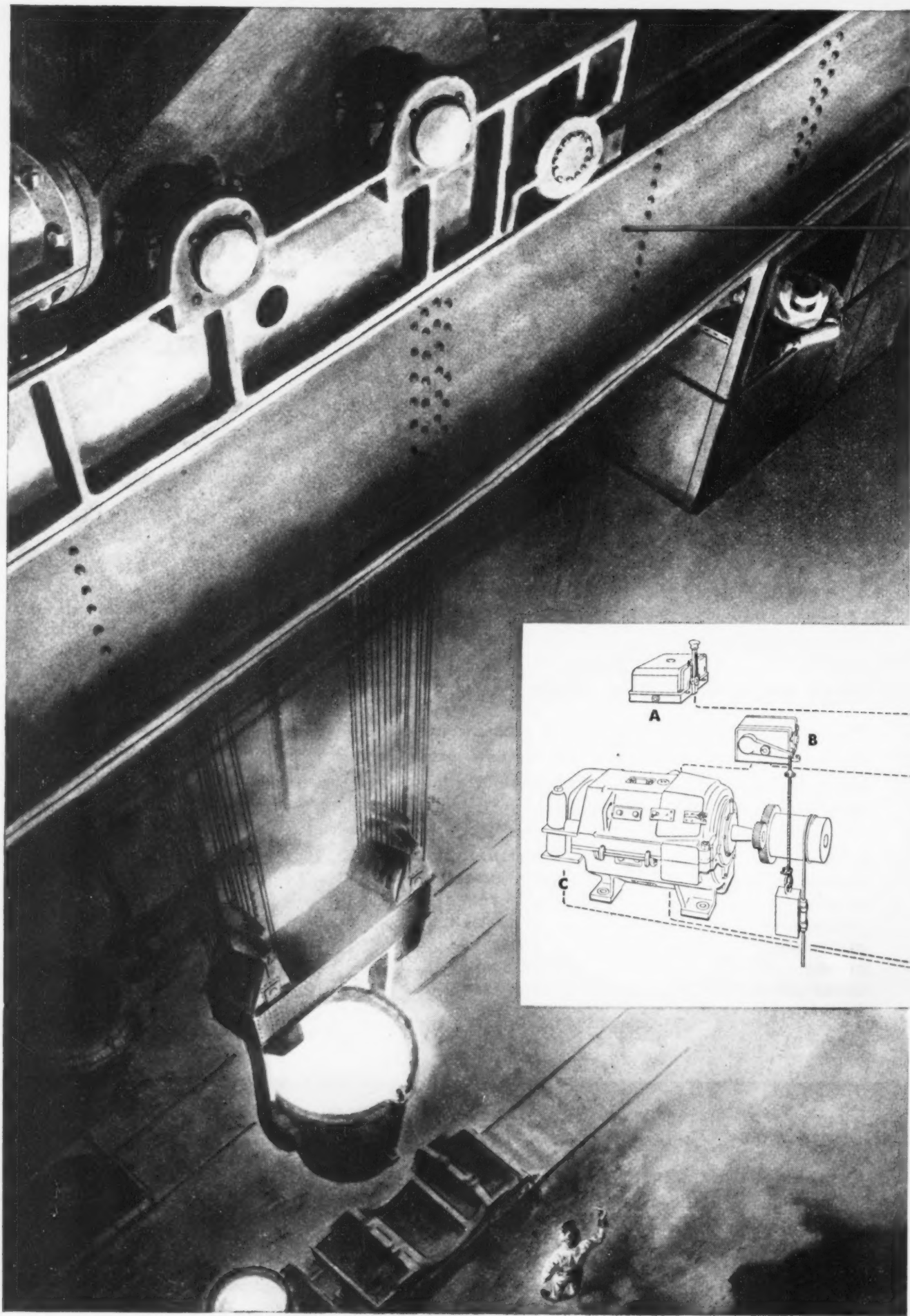
FENLIND MICRO FINISHER equipped with BEHR-MANNING Carbide Tool Finishing Belt. A simple angle-setting device assures accurate cutting angles.



BEHR-MANNING
CORPORATION
division of NORTON Company

- ▲ COATED ABRASIVES
- ▲ SHARPENING STONES
- ▲ PRESSURE-SENSITIVE TAPES

For Export: Norton Behr-Manning Overseas Inc., New Rochelle, N. Y., U. S. A. In Canada: Behr-Manning (Canada) Ltd., Brantford.



MILL RATED muscle for heavy hoisting

Steel mill crane hoist control must have the stamina to take ceaseless beatings. It must be built of components that are mill rated . . . that keep functioning regardless of exposure to dust, dirt, heat, cold and round-the-clock hard service.

The Westinghouse D-C Constant Voltage Crane Hoist Control meets these requirements. It is built to stand up to the daily abuse found in most steel mill operations. Heavy-duty, mill-type electrical equipment is used throughout. The Type M contactors and series-wound, 600-series, d-c motor

are mill rated. Dependable operation is further assured by the basic simplicity of the control system.

OPERATING CHARACTERISTICS ARE COMPLETE AND FLEXIBLE

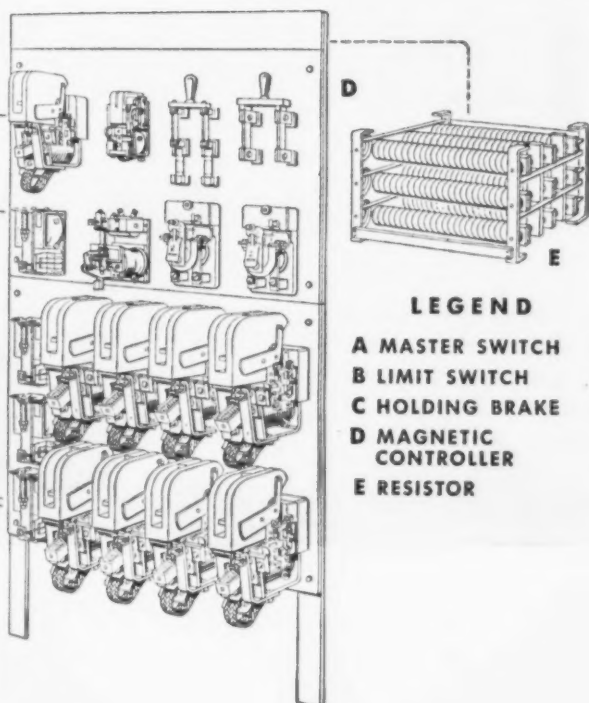
Loads Slip Into Place due to proper proportioning of speed increments between master switch points and selection of correct resistor connections.

Slow-Speed Hoisting Is Available with empty hook. In lowering, suitable kickoff torque is obtained with careful resistor design enabling the motor to reach steady-state speed quickly without overshoot.

High Lowering Speeds Are Available when required. The high-speed lowering point has an independent adjustment to facilitate closer control at these high speeds.

Standard Control Panel contains only nine contactors and four timing relays in addition to protective equipment. All are front mounted for easy accessibility. All are standard units.

New Heavy-Duty Contactors and a combined control system and resistor design, that prevent excessive current peaks during transitions or while plugging, prolong equipment life.



LEGEND

- A MASTER SWITCH
- B LIMIT SWITCH
- C HOLDING BRAKE
- D MAGNETIC CONTROLLER
- E RESISTOR

Get this Descriptive Booklet B-5420

Full descriptive information on all components of the Westinghouse D-C Constant Voltage Crane Hoist Control is contained in this free booklet. Your Westinghouse representative has a copy for you. Or, you can get a copy by writing direct to: Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-27017



YOU CAN BE SURE...IF IT'S
Westinghouse

CRANE CONTROLS



**for
your
rolling
mill
jobs**



there are **MACK-HEMP ROLLS**

developed to do them best

How?

Because *your* roll designers and mill operators have helped Mack-Hemp metallurgists in the development of our rolls, the rolls *with the striped red wabblers* turn in excellent production records.

For example, application of Mack-Hemp rolls in intermediate stands on high speed strip mills reduce costly down-time, because Mack-Hemp rolls stay in the mill longer without redressing.

Because we are working constantly to improve the rolls *with the striped red wabblers*, it's wise to keep your eye on what's new at Mack-Hemp.

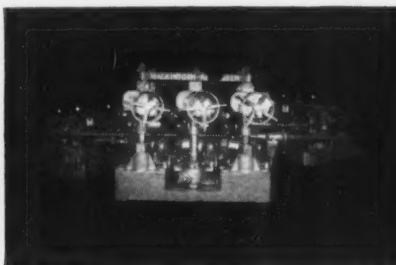
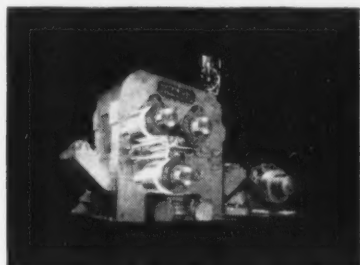
MACKINTOSH-HEMPHILL CO.

PITTSBURGH AND MIDLAND, PA.

Makers of the Rolls with the Striped Red Wabblers

1952...

**Mack-Hemp's
one hundred fiftieth year
of continuous
product improvement**



Mack-Hemp makes modern equipment for steel mills:

Y-MILLS

Modern Mack-Hemp Y-Mill is the reversing cold strip mill which combines the advantages of small diameter rolls, power for high speed and deep draft in a compact, simple arrangement.

ROTARY STRAIGHTENERS

Mack-Hemp Rotary Straighteners straighten end-to-end to precision tolerances, and finish with no guide marks or scoring. They cut costs and insure quality of straightened product.

JOHNSTON CINDER POTS

Johnston Patented Cinder Pots are designed to fit your plant requirements. From small units for electric furnace use to giant thimbles for blast furnace and open hearth, Johnston Cinder Pots provide dependable slag disposal service.

*Because Mack-Hemp engineers keep pace with
modern steel mill practice, it's wise to keep your eye on what's new at Mack-Hemp.*

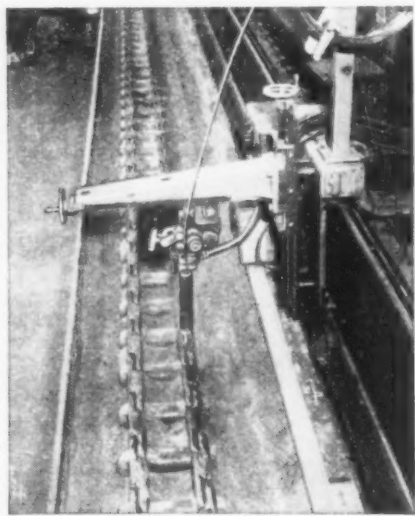


LINDE'S News of Metalworking

Worn Parts Rebuilt Economically by UNIONMELT Welding

Repair of worn tractor parts is most practical and economical with specially developed fixtures on which standard UNIONMELT welding units are mounted. The metal deposited by UNIONMELT welding is so smooth that no grinding or finishing is required. Experience indicates that resurfaced areas will wear as long as new parts.

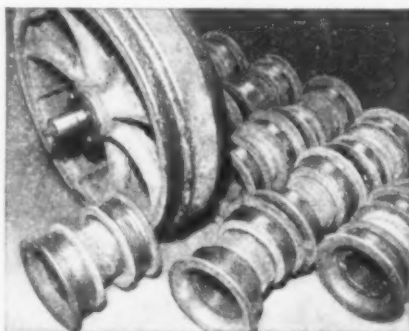
The Berkeley "Conservall" fixture is designed especially for rebuilding crawler tractor track links or rails without disassembling them. The track is placed in a trough and clamped in position. A LINDE side-beam carriage



Tractor rail links rebuilt in "Conservall" machine by UNIONMELT welding. Cams automatically control welding action for each link.

moves the UNIONMELT welding equipment over the positioned track and the welding of each link is automatically started, stopped, and accurately controlled. Rollers, idlers, sheaves, and other circular work can also be welded or resurfaced on another section of the machine.

The "Leader" machine is also available for rebuilding both cylindrical and flat parts. Rollers are rebuilt on top of the machine. Larger parts, such as idlers, are mounted in the chuck at the side of the machine as shown. With the flat work attachment, parts such as disassembled track rail links, grousers, bulldozer blades, end bits and fabricated members can be resurfaced easily. This attachment is operated by a gear which is mounted in the chuck.



These tractor rollers and an idler were rebuilt at a speed of 30 in. per min. by UNIONMELT welding.

With both machines, the wheels can be tilted for rebuilding the flanges. It takes only 80 to 90 minutes to rebuild a D-8 track roller. Idlers take about three times as long.

OXWELD 1928 rod is normally used in making these repairs. When wear is excessive, OXWELD 296 rod is sometimes used for the initial buildup which is then finished with OXWELD 1928 rod. For such resurfacing, use either Grade 80 or Grade 90 UNIONMELT welding compositions.

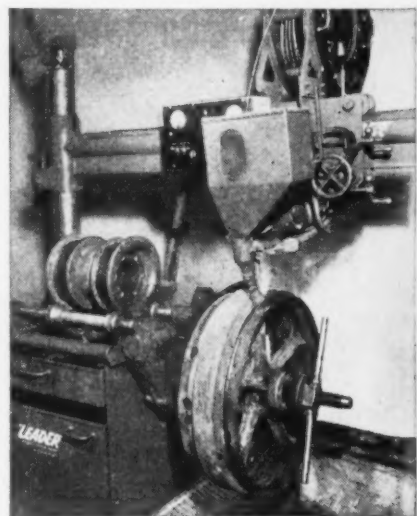
For some services, a finishing pass with a higher alloy tube rod is applied to produce a harder surface. While material of almost any hardness can be applied, one combining hardness and toughness lasts longer than one of higher hardness that tends to spall and chip. As deposited, OXWELD 1928 material has a hardness of about Rockwell C-25, but in service the working

surfaces actually develop properties which cause them to outwear deposits that are substantially harder.

Advantages of UNIONMELT Build-up


UNIONMELT welded resurfacing is especially attractive with these automatic machines which readily permit deposit rates of 20 lbs. per hour. Savings in time and the advantages of a smooth uniform deposit justify the initial investment in automatic equipment. Important in these times is the conservation of metal realized with the process. The use of approximately *one hundred pounds of weld metal* saves replacement of 2,000 to 3,000 pounds of new parts.

LINDE's engineers and technicians will be glad to give further information about UNIONMELT welding. Telephone or write today.



UNIONMELT welding head on "Leader" fixture rebuilds rollers and idlers. Rollers are welded on top of the machine, idlers at the side, and flat parts, depending on their size, can be welded on top of the machine or in the flat work attachment.

LINDE AIR PRODUCTS COMPANY

A Division of Union Carbide and Carbon Corporation
30 East 42nd Street  New York 17, N. Y.
Offices in Other Principal Cities
In Canada: Dominion Oxygen Company, Limited, Toronto

The terms "Linde," "Oxweld," and "Unionmelt" are registered trade-marks of Union Carbide and Carbon Corporation.

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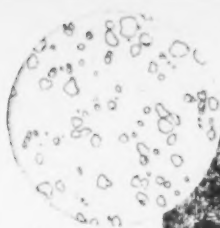
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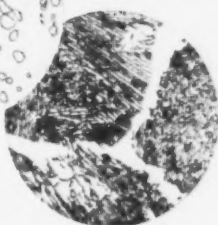
GE

**made right —
to make good
on the job**



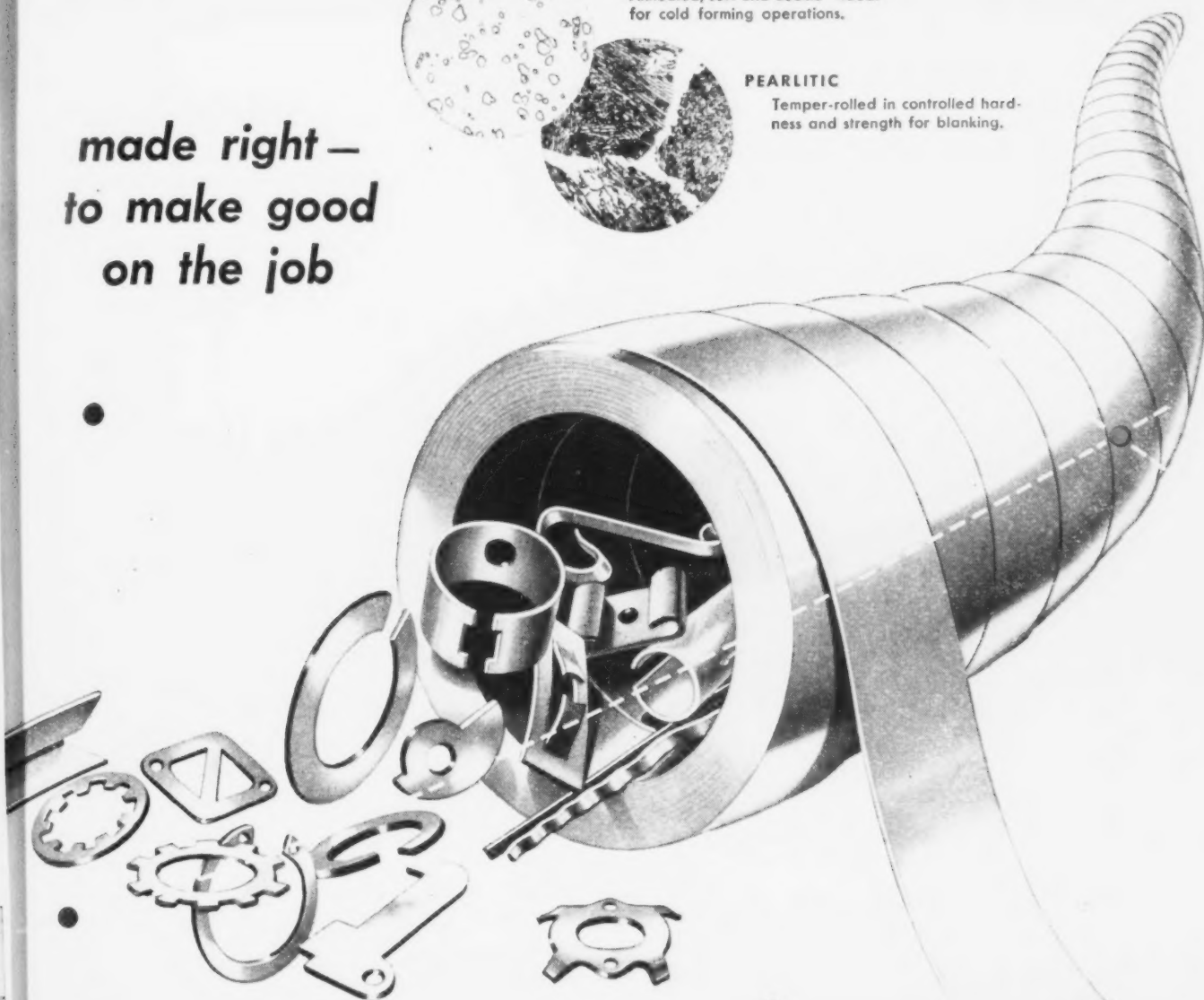
SPHEROIDIZED

Annealed, soft and ductile—ideal for cold forming operations.



PEARLITIC

Temper-rolled in controlled hardness and strength for blanking.



WEIRTON

HIGH-CARBON STRIP
COLD-ROLLED SPRING STEEL

There is a Weirton cold-rolled spring steel that is just right for forming . . . and another exactly right for blanking. Whichever you use, you will find that it makes the operation easier, and meets the requirements for many products in which high fatigue resistance is essential.

Weirton High-Carbon Strip possesses, to an unusual degree, these highly desirable properties and qualities: Accurate response to heat treatment. • Uniformity of gauge and width. • Uniform chemical and physical properties. • Exact constancy of grain structure. • Controlled decarburization limits.

Weirton High-Carbon Strip is obtainable with the desired chemical analysis and for specific heat treating and hardness ranges, in widths up to seven inches.



WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION





NEW • EFFICIENT • ECONOMICAL

Complete line equipment with latest improved operating features. Maximum volume production with minimum floor space requirements.

If you are interested in a new installation or improving your present equipment why not investigate the Youngstown Line!

these features

- | | |
|--|---|
| <input type="checkbox"/> Coil Box with Strip Opener. | <input type="checkbox"/> Fume Exhaust System—Roto Clone Scrubber. |
| <input type="checkbox"/> Triple Processor with Roller Leveller. | <input type="checkbox"/> Automatic Control System for Temperature and Acid Proportioning. |
| <input type="checkbox"/> Flash Welding and Mechanical Stitching. | <input type="checkbox"/> Side Trimmer with Scrap Cutting or Balling. |
| <input type="checkbox"/> Single Cycle Up-Cut Shears. | <input type="checkbox"/> Up-Coiler with Strip Oiling System. |
| <input type="checkbox"/> Heavy Duty Rubber Covered, Brick Lined Steel Tanks. | <input type="checkbox"/> Entry and Exit Coil Conveyors. |
| <input type="checkbox"/> Magnetic Loop Control for Acid Tanks. | |

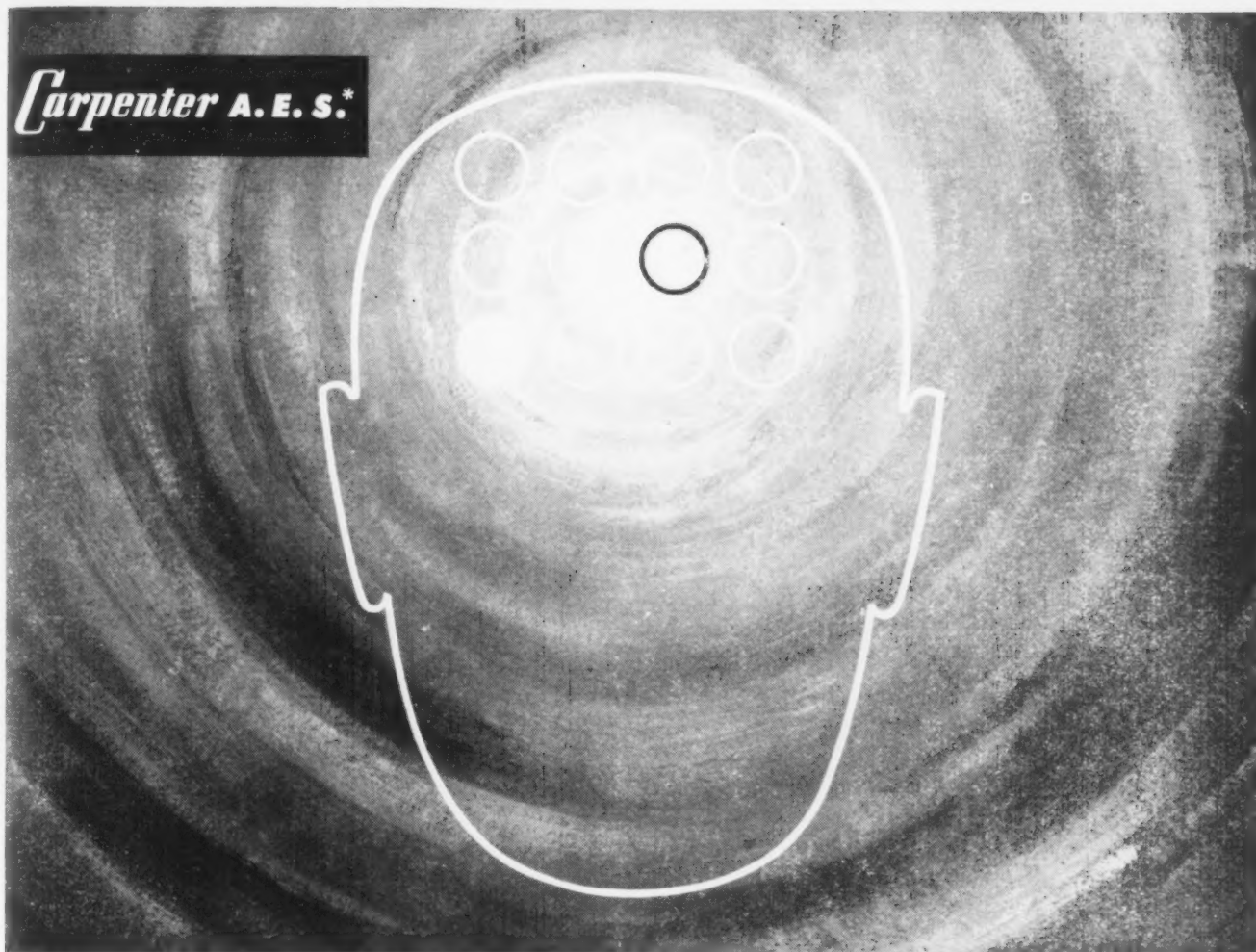
The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

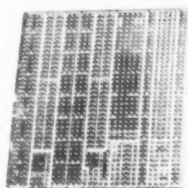


Carpenter A.E.S.*



Building a Brain that Makes a Machine "Think"

*Another example of how Carpenter
*Application Engineering Service
is working for industry*



Today's business, moving ahead at a fast pace, relies on modern business machines . . . equipment built with an almost uncanny ability to "think". And the design and building of components for equipment like this demand the best in imagination, detail . . . and materials. It's an interesting story. Just one example is the 9 $\frac{1}{2}$ " x 10 $\frac{1}{2}$ " electronic control panel shown at the left. Made from a plastic, it has 1,280 $\frac{5}{32}$ " dia. holes, six $\frac{3}{8}$ " dia. horizontal holes for heating and cooling, plus eight $\frac{3}{8}$ " dia. tapped holes on the edge. Steel after steel was tried for the molds used to produce the plastic panel. All failed

because they couldn't hold severe tolerances like the .0002" on centers of the 1,280 $\frac{5}{32}$ " dia. holes. It looked like one of those "impossible" jobs . . . until Carpenter was called in and Application Engineering Service went to work. Result: They used Vega (Air-Tough), a non-distorting tool steel invented by Carpenter for just such critical jobs. Of all steels tried, Vega was the *only* one to provide the almost perfect hardening accuracy required for successful performance of this mechanical "brain".

If Carpenter A.E.S. can work with other industries to help make possible the seemingly "impossible", it can do the same for you. Isn't it worth a try? A.E.S. goes to work as soon as you get in touch with your Carpenter Mill-Branch Warehouse or Distributor. THE CARPENTER STEEL CO., 121 W. Bern St., Reading, Pa.



Carpenter

Tool, Alloy and Stainless Steels

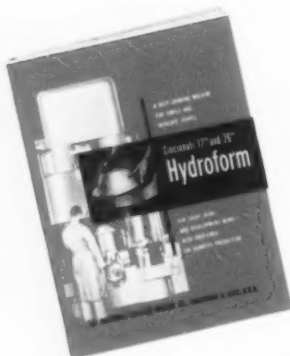
Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

Hydroforming

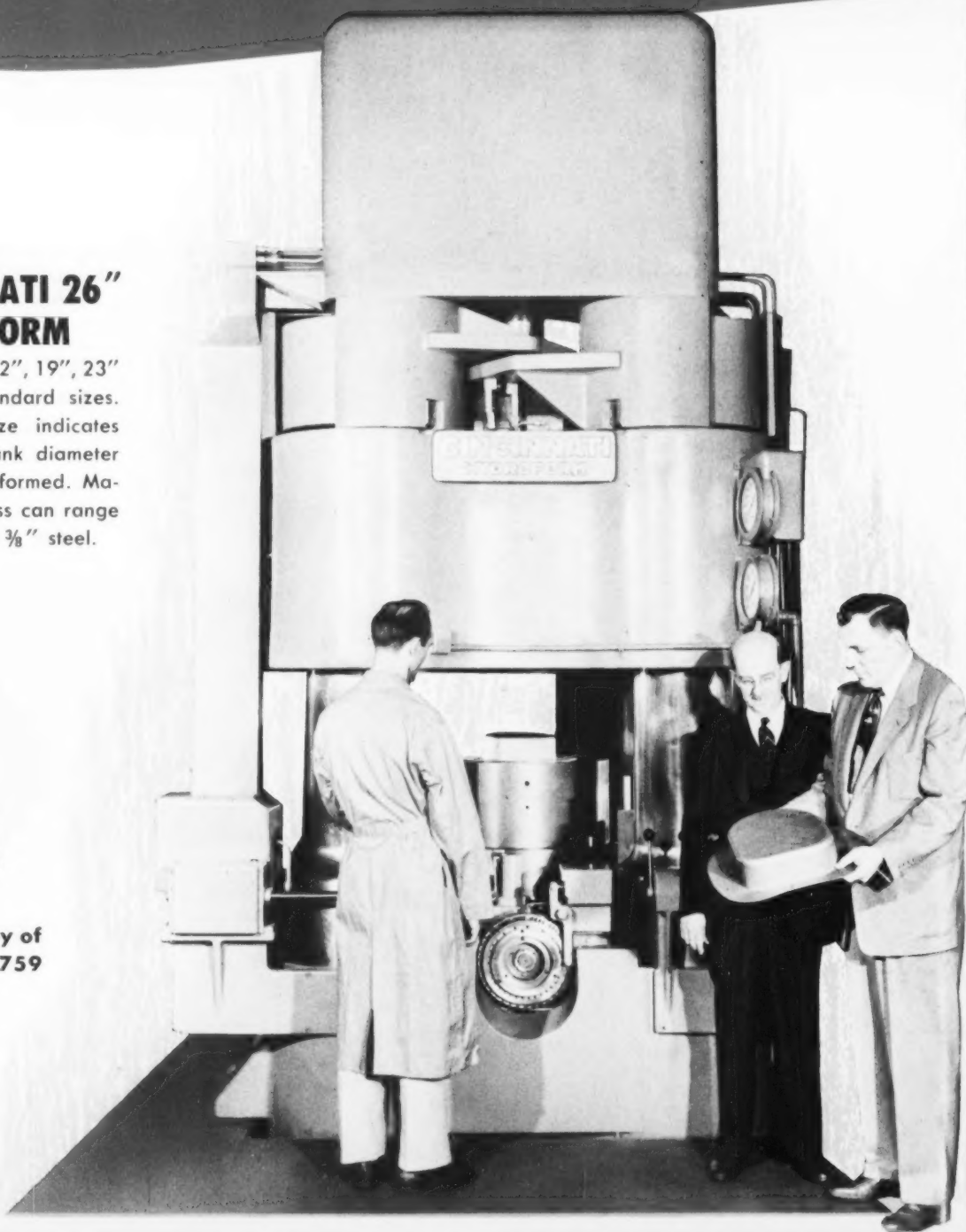
improves the quality of deep drawn parts

CINCINNATI 26" HYDROFORM

Also built in 12", 19", 23" and 32" standard sizes. Machine size indicates maximum blank diameter that can be formed. Material thickness can range from foils to $\frac{3}{8}$ " steel.



Write for your copy of
Hydroform Bulletin M-1759



THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO

Here's deep drawing with a kid glove touch!

Pre-polished blanks of 20-gage Type 302 Stainless Steel, having a protective plastic coating over the entire blank surface, were Hydroformed in one operation to produce the Corner Ball shown above. The fact that Hydroforming does not impair the finish of the material is dramatically illustrated here, as these parts are drawn with the plastic coating still intact!



Deep drawing by the Hydroforming process utilizes a punch working upward into a universal die member—an oil cavity sealed by a flexible diaphragm. Sheet materials are formed to the shape of the punch by controlled hydraulic pressure.

SURFACE FINISH IS UNIMPAIRED

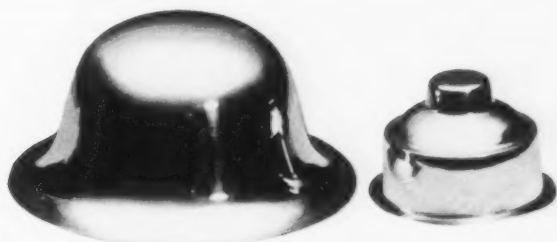
The cushioned action of the flexible die member cannot mar the surface of the material being formed. Parts can be formed *after* the material is painted, plated, lithographed or highly polished.

Conventional drawing methods leave a succession of draw marks on parts produced by two or more draws. The number of draws required to Hydroform a part does not affect the surface finish quality.

MECHANICAL VALUES ARE IMPROVED

Due to the unique drawing action, Hydroforming retains higher mechanical and physical values in the part. Because the material is uniformly worked during the draw, localized thin-out is either greatly reduced or eliminated. Hydroforming reduces springback, improving the dimensional accuracy of the part.

In addition to substantial savings on secondary finishing operations, Hydroform users report improved part quality—greatly reduced tool costs—savings in materials—reduction in the number of required operations on many parts—less time required between release of drawings and the production of part samples—many other benefits. Can *your* manufacturing program use similar economies? Then investigate Hydroforming *now*—it will change your thinking on deep drawing and forming! Contact your nearest Cincinnati Milling Machine Co. representative for full information.



Sterling silver bowl and salt shaker base Hydroformed without scratching or scuffing the extremely soft surfaces. Very little secondary work is required to produce the lustrous finish.



Cuff Link face of gold-plated brass, Hydroformed after plating.



Note draw marks on part at right, produced by conventional method in 7 operations. Same part at left, produced in 3 operations by Hydroforming, has unmarred surface finish.



Section of conically shaped Hydroformed part gaged to show reduction of material thickness by forming. Note loss of only 0.005" and 0.0035" in the areas indicated. Identical section of this part produced by conventional method shows from 6% to 25% greater material reduction in same areas.

You can't stop a gusher with a bottle cap



You can't stop corrosion
with ordinary paints . . .

it takes BITUMASTIC COATINGS!

CORROSION can't be stopped by ordinary paints or conventional protective coatings. They can't protect surfaces against the ravages of rust for any appreciable length of time.

But Bitumastic Coatings can!

Unlike maintenance paints, Bitumastic® Protective Coatings are specially formulated from a base* of coal-tar pitch that is, for all practical purposes, impervious to water. When you keep moisture away from an exposed surface, you stop corrosion.

Bitumastic Coatings provide an extra-tough, extra-thick barrier against corrosive elements—a barrier that is impenetrable. And these coatings provide up to 8 times the film thickness of conventional paint coatings.

Bitumastic Coatings stop corrosion caused by moisture—acid fumes—alkaline fumes—corrosive soil—salt air—heat.

*Hi-Heat Gray contains a metallic base.

There are 6 Koppers Coatings—formulated to control corrosion of metal and deterioration of concrete. Use the coupon for full information.

SEND FOR SET OF FREE BOOKLETS!

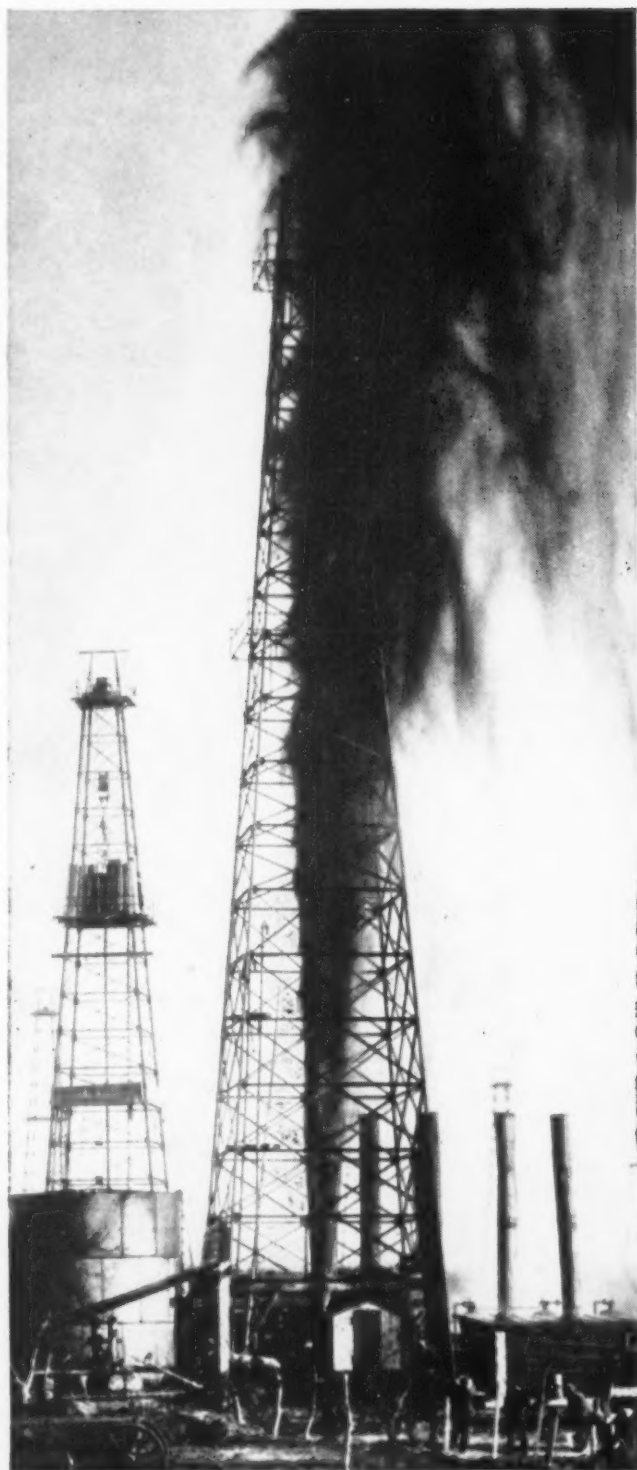
Koppers Company, Inc., Tar Products Division
Dept. 1252-T, Pittsburgh 19, Pa.

Please send me, without charge or obligation, your booklets on corrosion prevention.

Name.....

Address.....

City.....Zone.....State.....



BITUMASTIC PROTECTIVE COATINGS

REG. U.S. PAT. OFF.

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INDUSTRIAL
DISTRIBUTORS

KOPPERS COMPANY, INC., Tar Products Division, Dept. 1252-T, Pittsburgh 19, Pa.

DISTRICT OFFICES: BOSTON, CHICAGO, LOS ANGELES, NEW YORK, PITTSBURGH, AND WOODWARD, ALA.



FAIRBANKS-MORSE DIESELS CAN BE YOUR

Power Keys

Here are the keys that have opened the way to adequate, reliable power for many plants—small and large. They have eliminated the penalty paid due to poor power factor, surge loads and adverse current characteristics.

But, Will They Fit Your Problem?

Look at the list! Would compact in-plant power generation unlock your plans for plant expansion... eliminate the need of using purchased power at

rates based on *high* peak demand values... add to current capacity? The answer is yes—and it can mean the difference between profit and loss in your plant.

If you are seeking the keys to your power problem, write us today, outlining your needs. Fairbanks-Morse engineering can give you a *proved* answer... based on over 50 years' experience in industrial and municipal power generation. Fairbanks, Morse & Co., Chicago 5, Ill.



FAIRBANKS-MORSE,

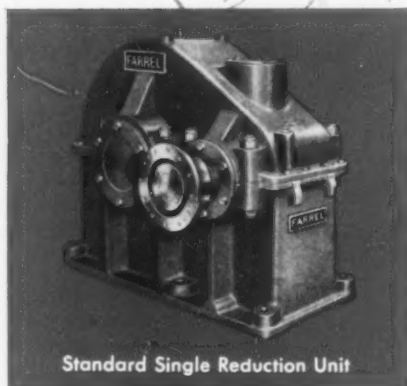
a name worth remembering when you want the best

DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • ELECTRICAL MACHINERY • PUMPS • SCALES • RAIL CARS • MAGNETOS • FARM MACHINERY

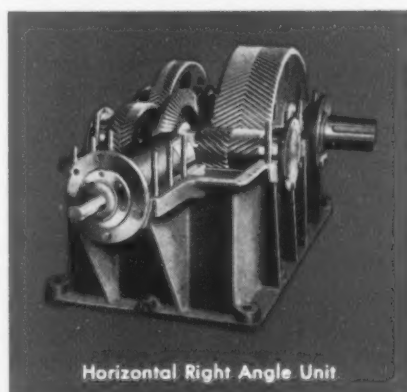
Put Your Power Costs and Performance in Order

- 1 **Handle Peak Demand**... reduce peak demand values for lower purchased power rates.
- 2 **Power Factor**... in-plant power generator can eliminate power factor penalties.
- 3 **Emergency Power**... insurance against lost production and damage resulting from line failures.
- 4 **Handle Surge Loads**... that may now be affecting current characteristics of entire plant.
- 5 **Plant Expansion**... need not be restricted due to lack—or expense—of ample power.
- 6 **Useful Heat**... lube oil, water and exhaust heat can be turned from waste to profit.
- 7 **Chemical Value**... exhaust gases are high in free nitrogen—available for economical fixation of nitrates, ammonia, etc.
- 8 **Insurance Advantage**... of diesel over gasoline engine, for example, will soon pay for installation.
- 9 **No Weather Worries**... ice, snow, sleet, wind storms can't stop plant operations.
- 10 **Handle Increasing Load**... in-plant power economically adds to current capacity as loads increase.
- 11 **Fuel Economy**... use diesel oil, natural gas or sewage gas for added economy.
- 12 **Remote Locations**... distance from transmission lines needn't curtail plant expansion.
- 13 **More Compact Power**... Fairbanks-Morse engines give you more power per foot of floor space, more power on present foundation.
- 14 **Minimum Attendance**... Fairbanks-Morse in-plant generating sets require far less supervision or maintenance.
- 15 **Save Cost**... of running in new line where present transformers and power lines are already loaded.

FIVE ANSWERS TO SPEED REDUCER PROBLEMS



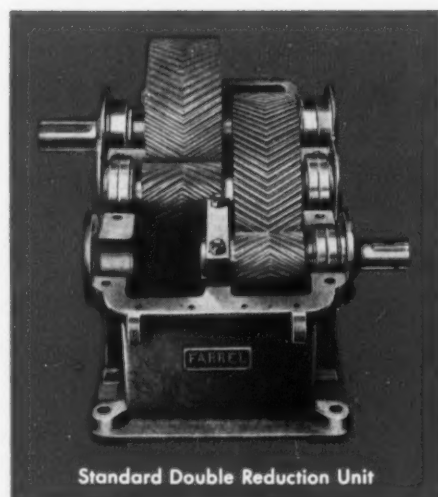
Standard Single Reduction Unit



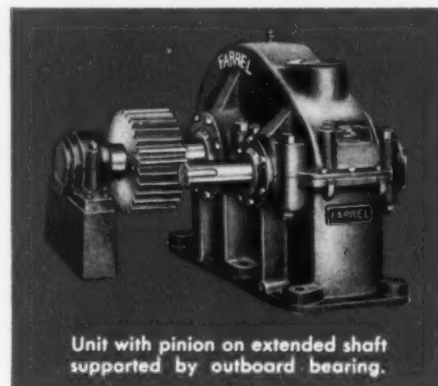
Horizontal Right Angle Unit



Heavy Duty Single Reduction Unit



Standard Double Reduction Unit



Unit with pinion on extended shaft supported by outboard bearing.

Farrel speed reducers are made in a number of different types, with a wide range of ratios and capacities. Designs include single, double and multiple reduction units, speed change units having two or more selective speeds, right angle drives, and drives to meet special requirements.

All units are supplied with precision gears, generated by the famous Farrel-Sykes process for smooth, quiet, efficient power transmission; shafts and bearings factored to safeguard against interruption of vital processes; gear cases proportioned to withstand repeated heavy peak loads; joints sealed to prevent entrance of dirt.

Send for further details of these designs. Ask for a copy of Bulletin 449 — no cost or obligation.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

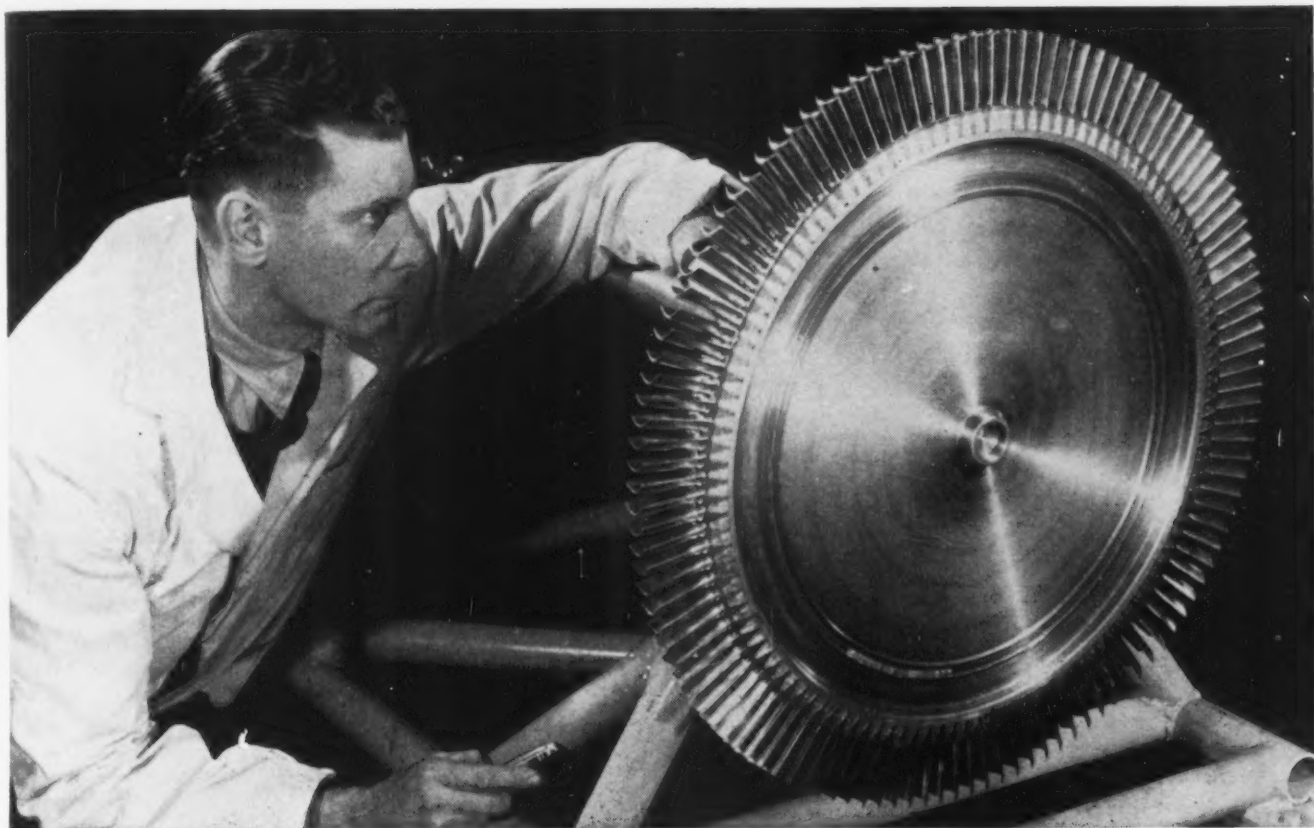
Plants: Ansonia and Derby, Conn., Buffalo, N.Y.

Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Detroit, Chicago, Minneapolis, Portland (Oregon), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

FB-745

Farrel-Birmingham ^(R)

More "16-25-6" used in jet engine rotor wheels than all other alloys combined



...and here are 3 big reasons why:

TODAY, more "16-25-6" goes into solid and composite jet engine rotor wheels than all other super-alloy steels combined! That's because "16-25-6" has the best combination of the three top requirements for jet engine rotors:

1. "16-25-6" has good high temperature properties. Operating at temperatures up to 1500° F., it retains high creep and stress rupture strength. And it has excellent resistance to scale and corrosion.

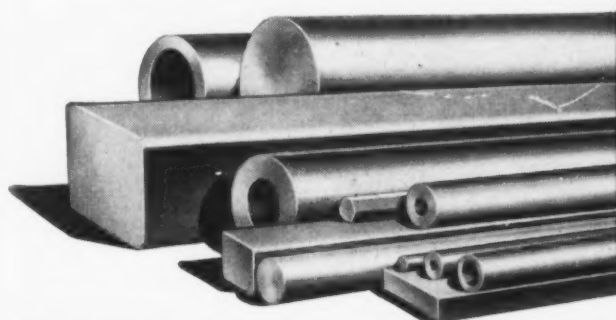
2. "16-25-6" is relatively low in strategic alloys. It uses

none of the highly strategic alloys, contains no cobalt or columbium.

3. "16-25-6" has good machinability.

Put the Timken Company's wide experience in high temperature steels to work for you. We'll help you adapt "16-25-6" to your purposes—or help you choose other alloy steels suited to today's high temperature, high speed applications. Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



TIMKEN
TRADE-MARK REG. U.S. PAT. OFF.
Fine Alloy
STEEL

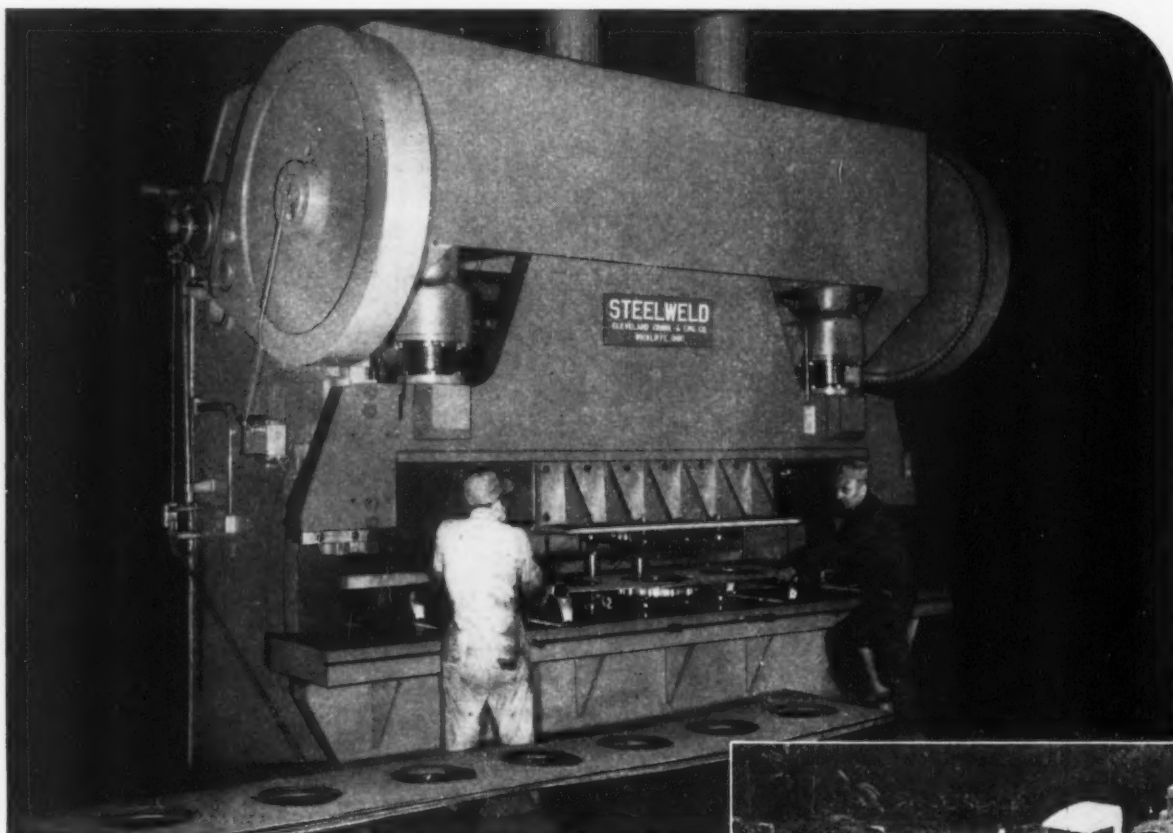
SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

December 18, 1952

Punches 15" Holes For Warner & Swasey Gradalls

Also Performs Bending and Flanging Operations

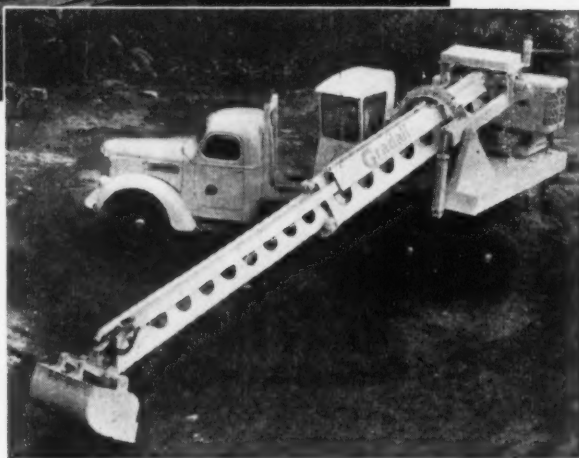
Flanging 15" diameter holes in outer boom plates of 3/16" steel. The holes were punched previously on this press.



Practically all of the steel plate on Warner & Swasey Gradalls, manufactured at their New Philadelphia, Ohio plant, is formed, punched and flanged on a Steelweld Press which is designed to brake steel plate up to 16' x 1/2".

One of the more interesting jobs done on this machine is the punching of 15" diameter holes in Gradall boom plates, followed by a flanging operation. Through use of special movable punches, many smaller holes of various sizes are made at a time, in locations as desired.

The versatility of Steelweld Presses to handle efficiently many varied operations has proven of tremendous advantage to many users. You, too, may find the many features of these machines of great help. A representative will be glad to give you the details.



Gradall ready for action. Has 1/2 yd. bucket and 24 ft. telescoping boom that lifts, tilts, and turns 360° around truck.



GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

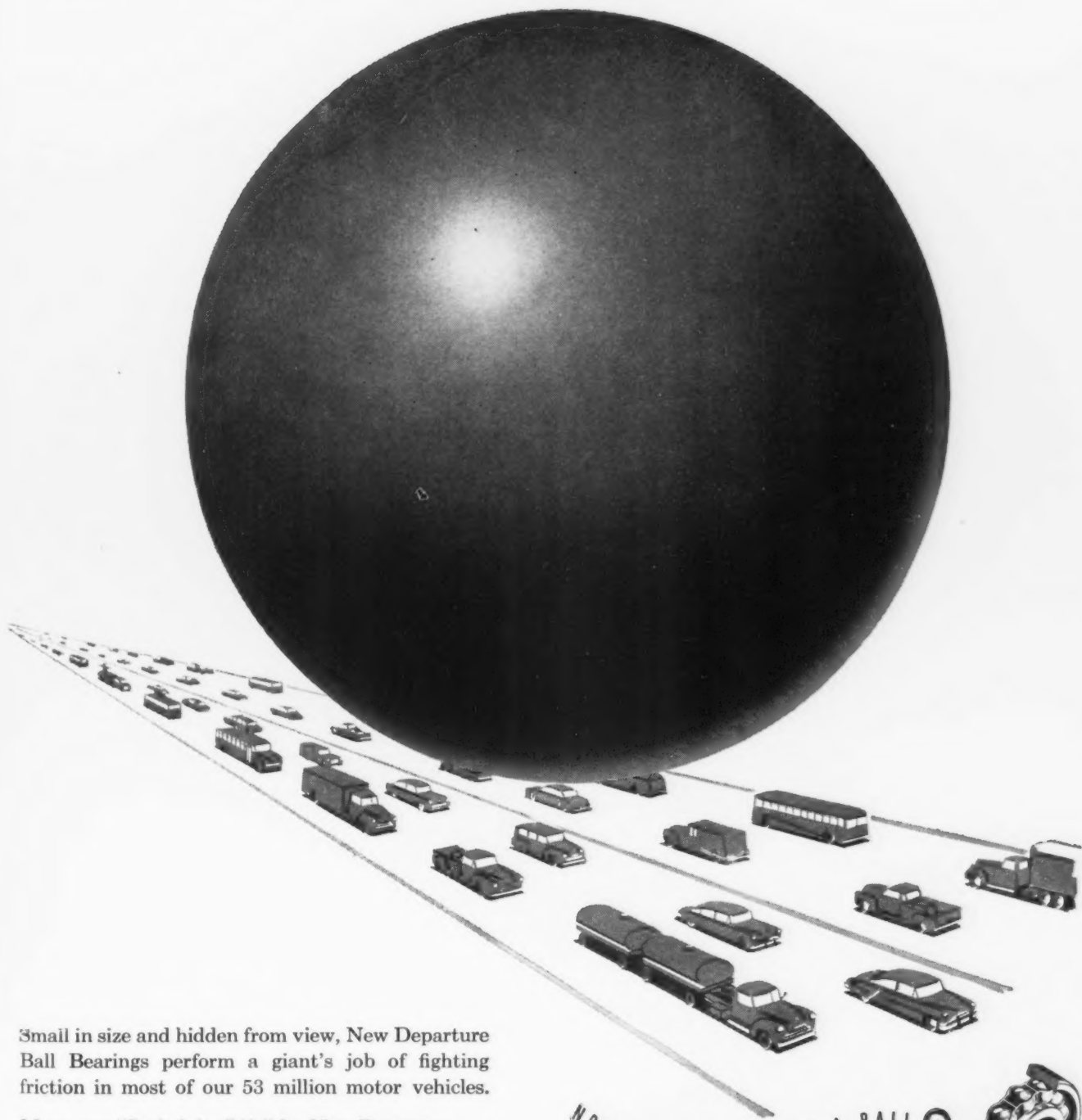
4812 EAST 281st STREET • WICKLIFFE, OHIO

STEELWELD

BENDING PRESSES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

Little Giant of the highway



Small in size and hidden from view, New Departure Ball Bearings perform a giant's job of fighting friction in most of our 53 million motor vehicles.

Many are "Sealed-for-Life" by New Departure . . . installed on fan and water pump shafts, propeller shafts, transmissions and rear wheels. With dirt sealed out and lubricant sealed in, they provide longer wear with less care. N-D-Seal bearings also simplify product design and reduce maintenance.

Through its resources of research . . . its engineering excellence . . . its precision production . . . New Departure is the recognized leader. Keep your eye on the BALL to be sure of your BEARINGS!

NOTHING ROLLS LIKE A BALL



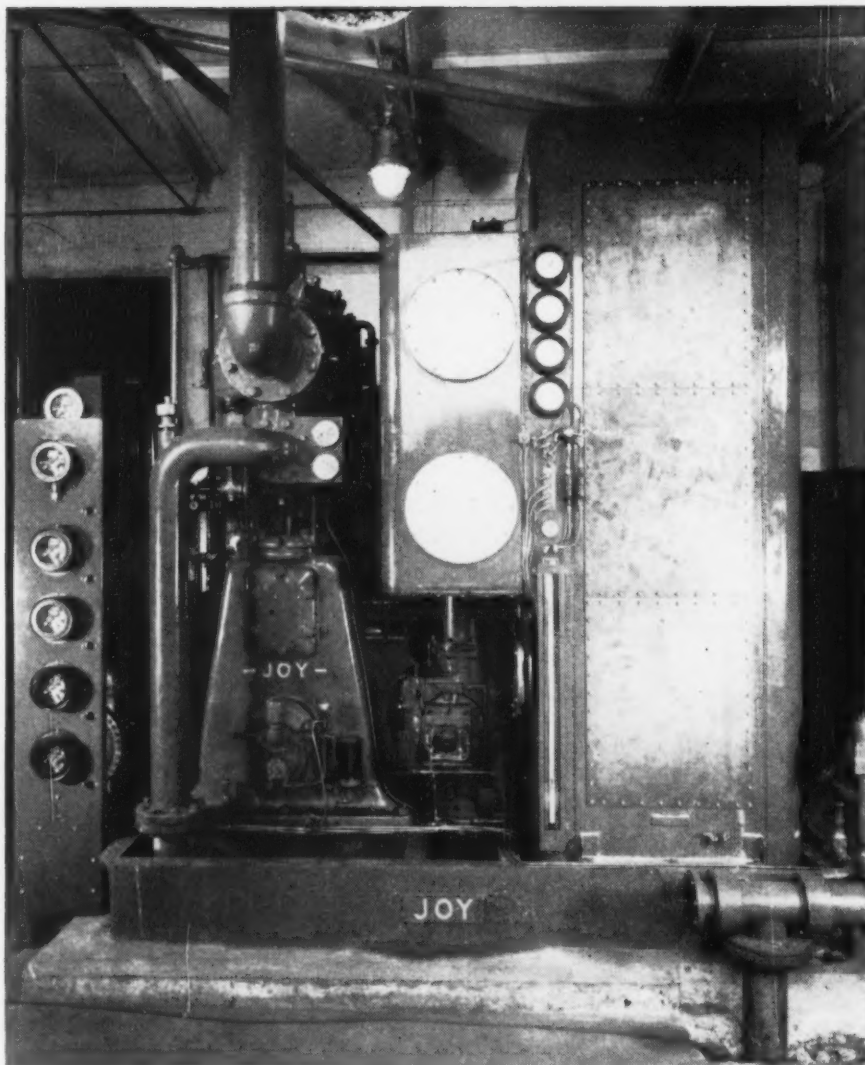
NEW DEPARTURE
BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

Own your own JOY plant for making HIGH-PURITY OXYGEN



*"No other way
is as cheap!"*



WHY depend upon outside sources for your oxygen supply? You don't buy compressed air in bottles or in liquid form—*why oxygen?* Especially when you can produce your own high-purity oxygen with a JOY Generator at a substantial saving—at least 50%!

The Joy principle of operation is an exclusive development. It's completely mechanical and automatic . . . no messy chemicals to handle and no residues to remove. The only raw material used is air, and the units are self-cleaning. Operating pressure is low (only 185 psi) and the use of pop safety valves and an automatic shut-off system makes for high inherent safety.

JOY Oxygen Generators are remarkably compact, and as simple to operate as an air compressor. The complete line includes

units ranging in capacity from 500 to 12,000 cu. ft. of oxygen per hour at a purity of 99.5+%. • For the most economical solution to *your* oxygen supply problems, write us your requirements. Address *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*

W&D-14218

JOY

**SPECIALISTS IN THE COMPRESSION AND
MOVEMENT OF AIR AND GASES SINCE 1885**



FROM THE TOP STEEL PRODUCER . . .
TO A LEADING CHEMICAL HOUSE,
A YEAST COMPANY
AND A MEAT PACKER . . .

Heat Prover

SERVES 62 DIFFERENT COMPANIES
IN THE GREAT CHICAGO INDUSTRIAL AREA!

The Cities Service Heat Prover is graphically proving its worth to all kinds of industry in the Chicago area and elsewhere throughout the country.

62 different companies, producing everything from steel to beef, have found the Heat Prover an important aid to increased production and big dollar economy.

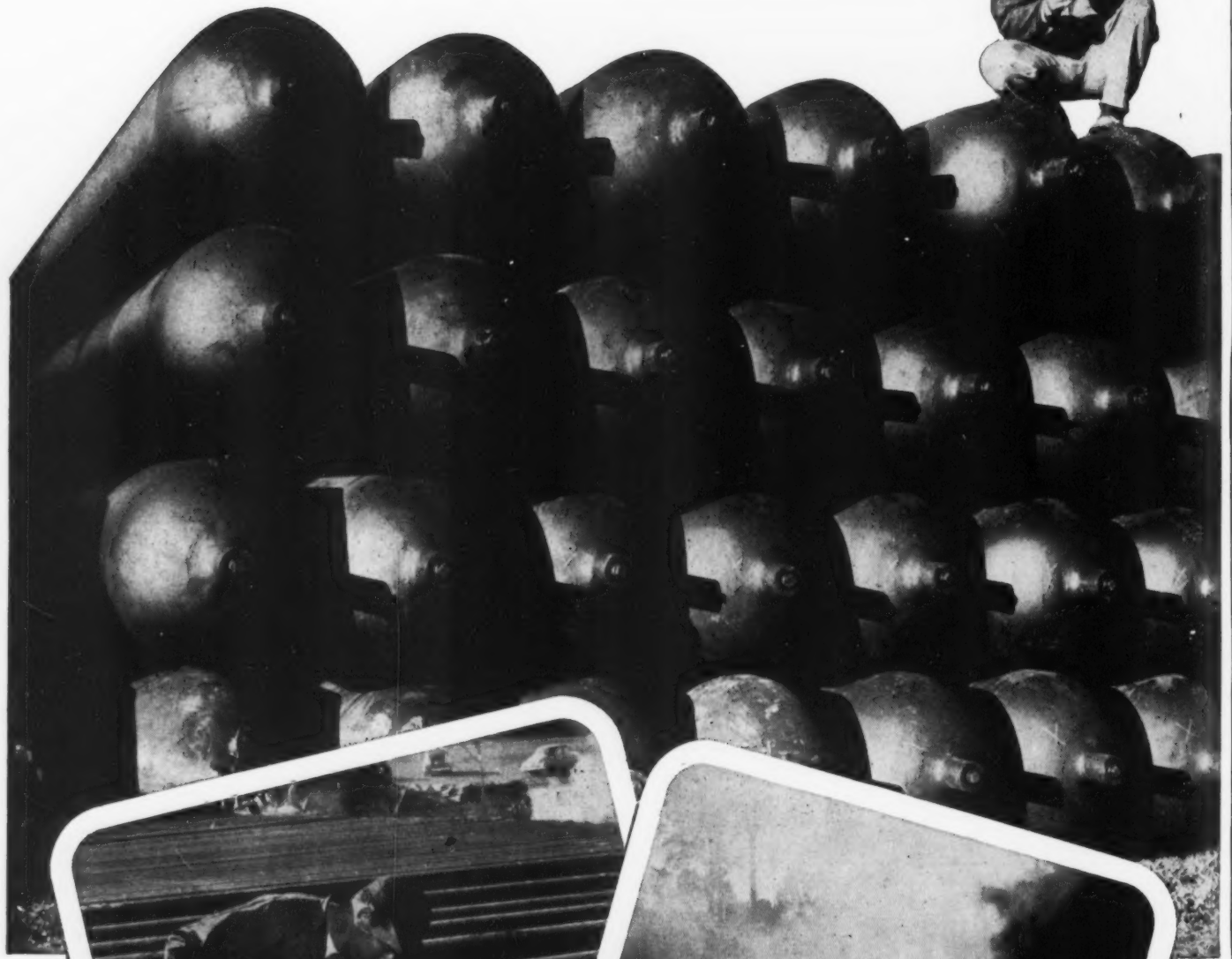
WHEREVER A FURNACE OPERATION IS INVOLVED, Heat Prover can help increase productivity by providing:

- ① Rapid, continuous sampling.
- ② Simultaneous reading of oxygen and combustibles.
- ③ Direct measurement of oxygen and combustibles.
- ④ Easy portability.
- ⑤ No maintenance; no re-calibration.

REMEMBER: Heat Prover is not an instrument you buy but a service we supply. Contact the Cities Service office in your area and learn how Heat Prover can serve you . . . or write CITIES SERVICE OIL COMPANY, Dept. L16, Sixty Wall Tower, New York City 5.



The modern way



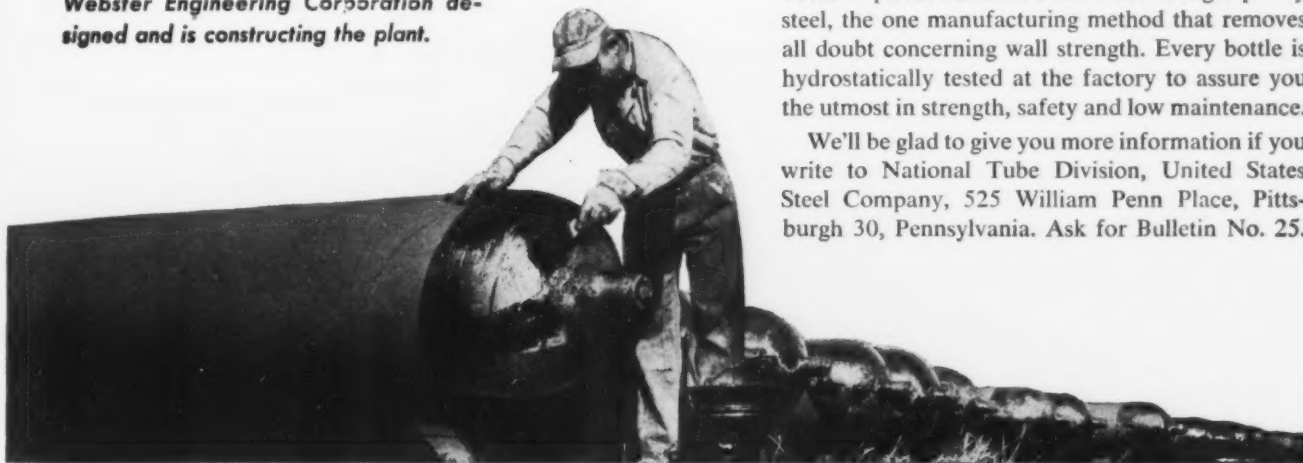
to store gas

as exemplified by an installation
under construction for the

WASHINGTON GAS LIGHT COMPANY

where 2800 NATIONAL
SEAMLESS BOTTLES
will store 70 million
cubic feet...
-safely underground

● The Washington Gas Light Company installation is a combination of underground high pressure natural gas storage and propane-air. The steel bottles are laid out in blocks of 40 bottles, each block storing a million cubic feet of gas. The bottles are installed in the ground with 4 feet of cover, after being coated and wrapped. In addition, the storage bottles and piping will be cathodically protected. Stone and Webster Engineering Corporation designed and is constructing the plant.



NATIONAL TUBE DIVISION, UNITED STATES STEEL COMPANY, PITTSBURGH, PA.

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U-S-S NATIONAL SEAMLESS STEEL BOTTLES

UNITED STATES STEEL



Some of the advantages
of this type of storage are:

SAFETY. The bottles are unaffected by storms, high winds or lightning. They are not a hazard to or from aviation.

UNIFORM PRESSURE. Underground temperatures are relatively stable the year round. Gas pressure does not fluctuate like it would if stored above ground.

COMPACT. These high pressure bottles take up less room.

STABLE. Bottles buried won't vibrate and settle like a surface installation.

EASIER MAINTENANCE. Leaks are easily located and any block may be purged and taken off the line without interruption of flow from other blocks. These National Seamless Bottles are inspected twice at the factory and twice in the field.

LESS MAINTENANCE. Unlike above-ground installations, these bottles do not have to be painted periodically and they do not require constant inspection and protection against the elements.

When you lay long range plans for a gas storage system, consider the advantages of underground storage with National Seamless Steel Bottles. Each bottle is pierced from a solid billet of high quality steel, the one manufacturing method that removes all doubt concerning wall strength. Every bottle is hydrostatically tested at the factory to assure you the utmost in strength, safety and low maintenance.

We'll be glad to give you more information if you write to National Tube Division, United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pennsylvania. Ask for Bulletin No. 25.



**Put Reynolds Technical Knowledge
And Experience To Work For You...**

SEND FOR THESE *Free* BOOKS and FILMS

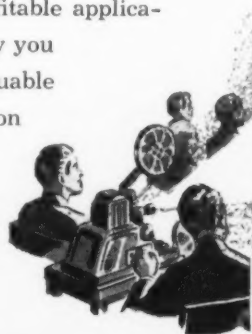
on Aluminum Design and Fabrication

Here's the library of Reynolds Technical Books and Films for industry . . . comprehensive, illustrated handbooks and sound-color motion pictures on all phases of aluminum design and fabrication.

If you're part of a plant management, design or production group you'll find these interesting, helpful books of real value—you'll want one or more of them on your desk for ready reference. And, to put increased interest into your employee training programs and at technical society meetings, you'll want to show the 16mm, sound-color films.*

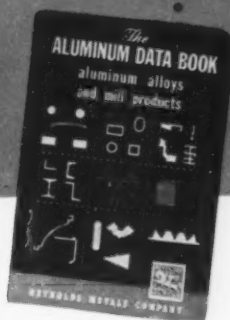
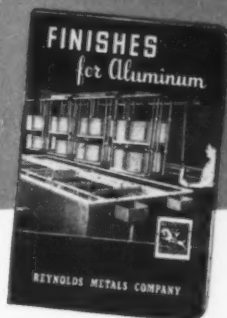
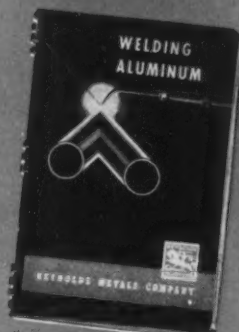
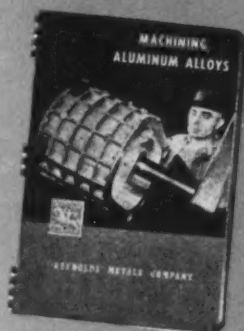
Whether or not aluminum is included in your products now, you can count on this . . . aluminum's low cost, strength with light weight, resistance to rust and corrosion and ease of fabrication assure a rapidly increasing number of profitable applications. More reasons why it will pay you to get acquainted with these valuable Reynolds handbooks and films on aluminum — top metal for today's designs and tomorrow's production.

**Instructors in technical schools are also invited to take advantage of these educational aids.*



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MODERN DESIGN HAS



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OF THESE VALUABLE
HANDBOOKS AND
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HANDBOOKS

- A-B-C's of Aluminum (from mine to finished products)
- Aluminum Data Book (Aluminum Alloys and Mill Products)
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- Forming Aluminum
- Heat Treating Aluminum Alloys
- Machining Aluminum Alloys
- Metals Weight Slide Rule
- Welding Aluminum

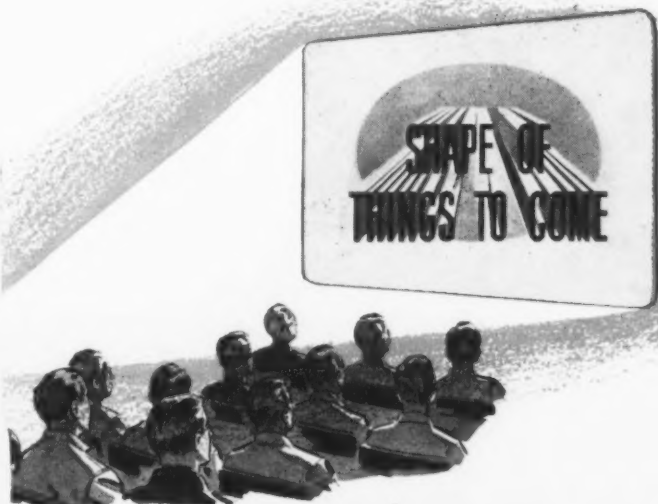
Handbooks are free when requested on business letterhead otherwise the price of each book is one dollar.

16mm COLOR-SOUND FILMS

- **SHAPE OF THINGS TO COME.** Interesting description of the aluminum extrusion process and the design opportunities it provides. Running time 30 minutes.
- **TALE OF THE POWDERED PIG.** Developments in aluminum powders and pastes including their application in protective and decorative coatings. Running time 22 minutes.
- **PIGS AND PROGRESS.** The complete story of aluminum from mine to finished products. Covers all forms of aluminum. Running time 26 minutes.

Films will be loaned to anyone requesting them on business letterhead.

Order from **REYNOLDS METALS COMPANY,**
2526 South Third Street, Louisville 1, Kentucky



ALUMINUM

ALUMINUM IN MIND

"These American Springs are better —and they cost less"

says Overhead Door Corporation

You don't have to be a Hercules to open these doors, because all the muscle-power is furnished by American Quality Springs. The door and springs are so delicately balanced that the massive 16-foot, 340-lb. garage door can be operated easily.

The American Springs for this application must withstand very large deflections (from 27" to 48"). They must exert a constant force as the door is raised and lowered; and they need a healthy amount of reserve strength for long life.

Failure is no problem with these American Quality Springs. As a matter of fact, Overhead Door



ANYBODY can open this 16-foot, 340-pound door. The American Quality Springs exert a constant pull, and allow effortless action.

AT TOP OF PHOTO, notice how far these American Quality Springs must deflect in the "OVERHEAD DOOR."

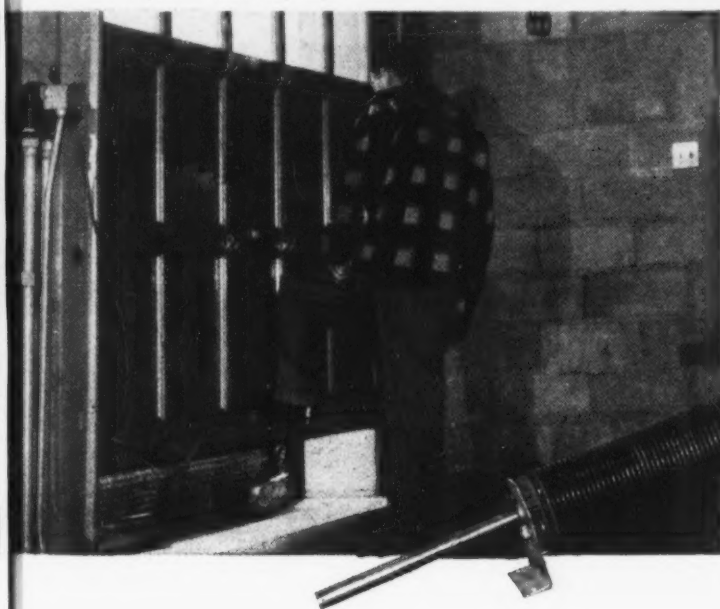
than counterweights

Corporation says, "We have been building doors for 32 years and practically all of those original doors still have their original springs."

The Overhead Door Corporation prefers a spring system (instead of counterweights) for two big reasons—and the most important one is cost. They get 500 pounds of pull from a spring at 25% less cost than if they used iron weights. Also, anyone who opens a spring-loaded door does not have to overcome the inertia of door plus weights. The door is practically weightless the instant you move it.

American Steel & Wire can produce and help you design a spring for just about any application, any size, any steel or finish. Let our skilled spring engineers show you how low in cost a truly superior spring can be. Call our nearest District Sales Office or write to American Steel & Wire Division, Rockefeller Building, Cleveland 13, Ohio.

"OVERHEAD DOORS" are widely used for industrial applications. Many of these industrial doors have been opened 100-150 times daily for 20 years without a spring failure.



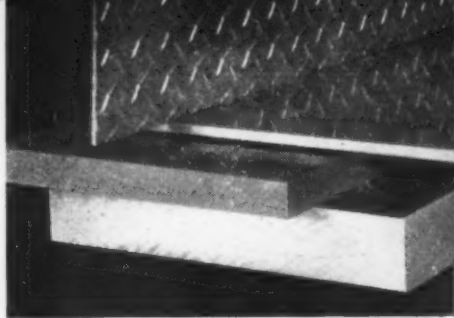
OVERHEAD DOOR CORPORATION also makes many doors utilizing torsion springs. This spring is actually twisted around a shaft when it "winds up." Despite the high stresses, these American Quality Springs give trouble-free service.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

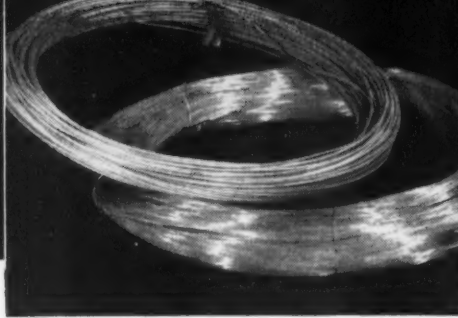


U.S.S. American Quality Springs

UNITED STATES STEEL



SHEET AND PLATE: Flat and coiled sheet; circles; patterned sheet; plate; tread plate; roofing and siding sheet; roofing accessories and fasteners; specialty sheet.

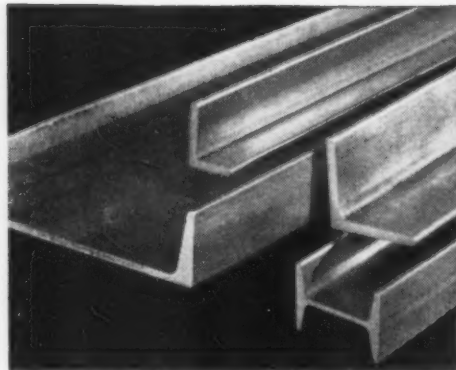


WIRE: Coiled and straight lengths; rivet wire; flattened and slit wire.

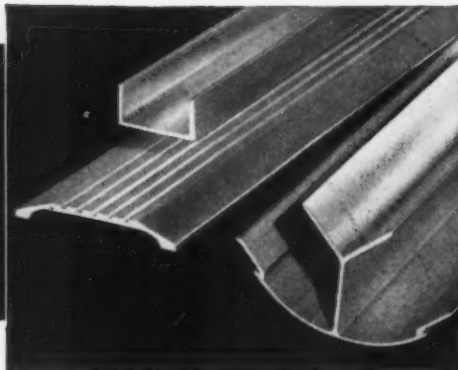


SCREW MACHINE STOCK: All free-cutting alloys plus the higher strength alloys—24S, 61S and 75S.

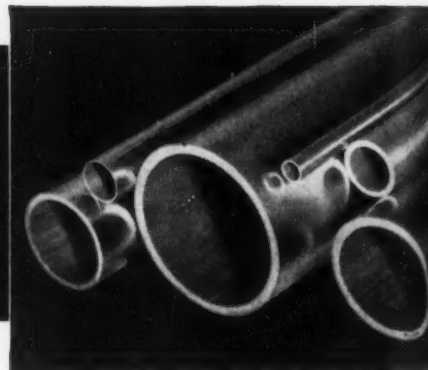
These are the **MILL PRODUCTS of ALCOA**



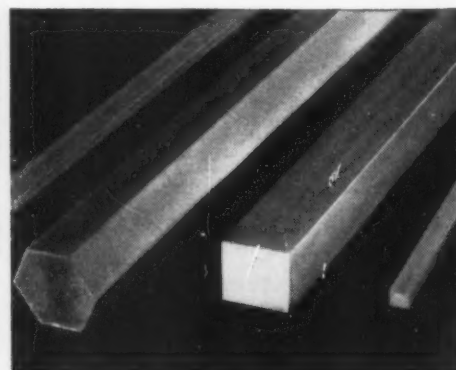
ROLLED SHAPES: Equal angles; unequal angles; channels; I-beams; H-beams; Tees; Zees.



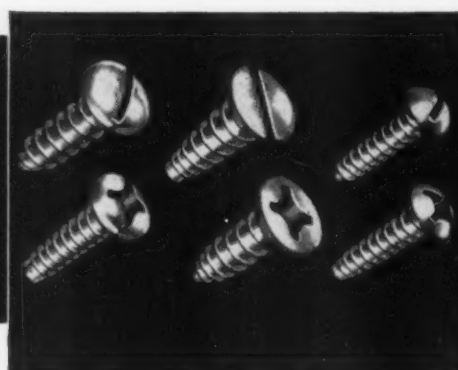
EXTRUDED SHAPES: Miscellaneous extruded shapes such as angles, channels, half rounds, quarter rounds, thresholds, truck corners and structural members, etc. Round, square, and rectangular bars.



TUBE AND PIPE: Coiled tube; straight tube in round, square and rectangular shapes; heat exchanger tubes; standard pipe and pipe fittings; irrigation pipe; rigid conduit.



BAR STOCK: Square, hexagonal and rectangular bar stock in free-cutting and higher strength alloys.



FASTENERS: Machine screws; wood screws; washers; nuts; bolts; rivets.



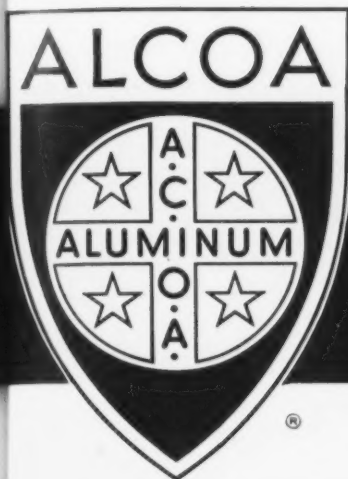
WELDING AND SOLDERING SUPPLIES: Welding and brazing wire; welding and brazing flux; solder flux; solder.

ALUMINUM COMPANY OF AMERICA

They have

these twelve basic advantages
and scores of others

- Lightweight
- High Resistance to Corrosion
- High Electrical Conductivity
- High Conductivity for Heat
- High Reflectivity for Light and Radiant Heat
- Workability
- Nontoxic
- Strength in Alloys
- Nonsparking
- Nonmagnetic
- Appearance
- High Scrap and Re-Use Value



With them

goes the skill of 64 years'
experience in fabricating,
assembling and finishing
aluminum

The world's greatest aluminum research
and testing facilities are available to help
you determine the suitability of aluminum
for your products. And to train your per-
sonnel, Alcoa offers technical literature
and how-to-do-it movies.

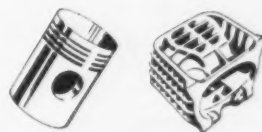
They are

available from your local
ALCOA sales office,
distributor or jobber

For all possible co-operation in filling
your orders, call your local Alcoa sales
office, distributor or jobber. You'll find
them listed under "Aluminum" in your
classified phone book.

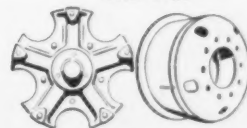
ALUMINUM COMPANY OF AMERICA
1807M Gulf Bldg. • Pittsburgh 19, Pa.

**ALCOA ALSO MAKES
PRODUCTS TO
CUSTOMER
SPECIFICATION**



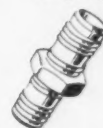
CASTINGS . . .

sand, plaster, permanent mold
and die.



FORGINGS . . .

drop, hammer and press
forgings.



**SCREW MACHINE
SPECIALTIES . . .**

special fasteners and screw
machine parts.



IMPACT EXTRUSIONS



EXTRUDED SHAPES

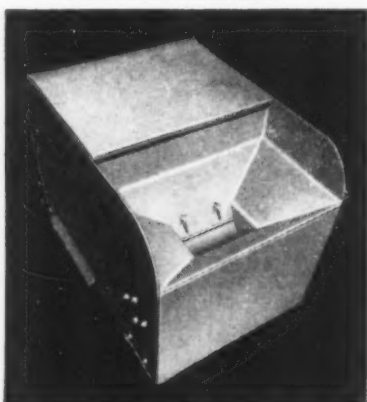


"SEE IT NOW" with Edward R. Murrow — CBS-TV every
Sunday . . . brings the world to your armchair. Consult
your newspaper for local time and channel.

ALCOA *first in* **ALUMINUM**

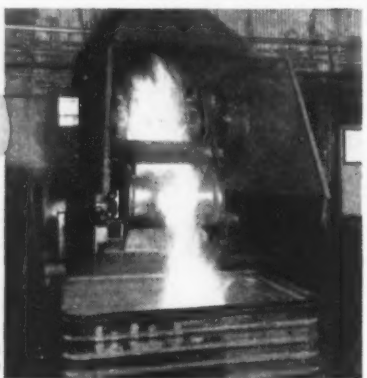
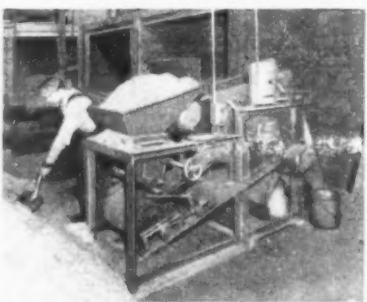
Here's
News

Dings Alnico Magnet is guaranteed for the life of the separator.



New Dings MA Scrap Separator

OTHER DINGS SEPARATORS



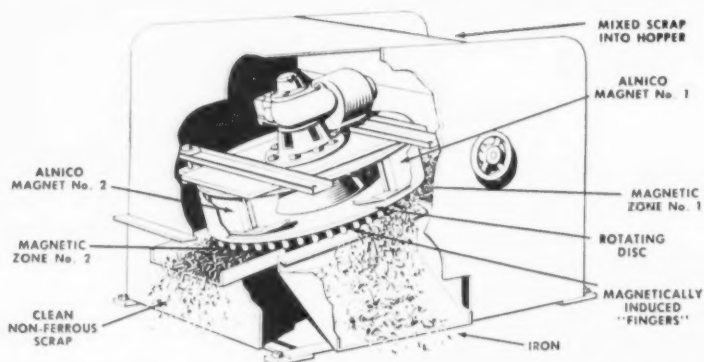
TOP — Double Magnetic Pulley Separator unit at work in one of world's largest non-ferrous metal foundries.

BOTTOM — Rugged non-electric Perma-Drum separating iron chips from red brass.

More \$\$\$ for Non-Ferrous Scrap with —

NEW DINGS "MA" NON-ELECTRIC DUAL ZONE SCRAP SEPARATORS

DINGS, MILWAUKEE — You'll get more money when you get the iron out with a Dings *Dual Zone MA* — a new scrap separator that handles dry, wet, greasy, or oily flows of loosely entangled scrap with equal ease. Iron is double-trapped in the Dings MA — scrap is passed through *two* magnetic iron removal zones to doubly insure the cleanest product possible.



HOW IT WORKS — Mixed scrap from vibrating feeder flows down chute through two magnetic zones created by powerful, non-electric Dings Alnico Magnets. In each zone iron is picked out and discharged to the side by magnetically induced "fingers" on a rotating disc. Any iron getting through the first zone is removed in the second.

NON-ELECTRIC — You don't need generator sets or rectifiers with Dings MA Scrap Separators. Magnetic permanence of the powerful Dings Alnico Magnet is guaranteed for the life of the separator.

New Bulletin

Get the whole MA story in new bulletin B-1600-A. Write, today!



DINGS MAGNETIC SEPARATOR COMPANY

4709 W. Electric Ave., Milwaukee 46, Wis.

DINGS  MAGNETS



Help Yourself to Profit

WHILE YOU HELP SAVE

COPPER AND BRASS

FOR DEFENSE



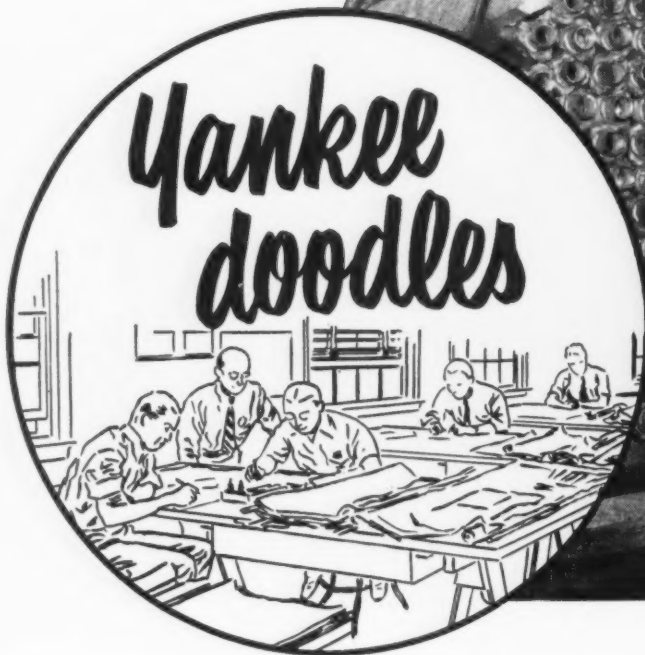
SuVeneer[®]
CLAD METALS

There's a two-way benefit in every coil of **SuVeneer** Clad Metals: profitable economy for you, and conservation of critical materials for defense.

The *solid* copper or brass on steel represents a saving of 70% to 80% over equivalent gauges of the single non-ferrous metals, and brings the inner strength of steel to your copper or brass product applications. The metals are bonded inseparably—you use your regular fabricating methods with this time-proved product. • Let us cooperate with you.

Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

BUILDING A GREATER AMERICA



Every dot on the draftsman's sketch has real meaning for the workmen in the boiler shop at Sun Ship as they assemble a tempering kiln 9' I.D. and more than 47 feet in length.

A newspaper humorist some years ago "defended" the efficiency man, saying that he could probably do a job as well as the next man "if you gave him time to doodle a ream of blueprints."

Well, there's always time for a chuckle, even in a plant as big and busy as Sun Ship. But there's also appreciation of the part the draftsman's "doodles" play in the good old motto of *Plan Your Work—Work Your Plan*.

Many a time in Sun Ship's 36 years of growing, good drafting has been the key to special service for the company's customers. A clearance drawing has revealed a way of speeding shipment by a change of route. A print has shown that parts of a piece of equipment being rebuilt could be made right in Sun Ship's versatile plant . . . and save valuable time.

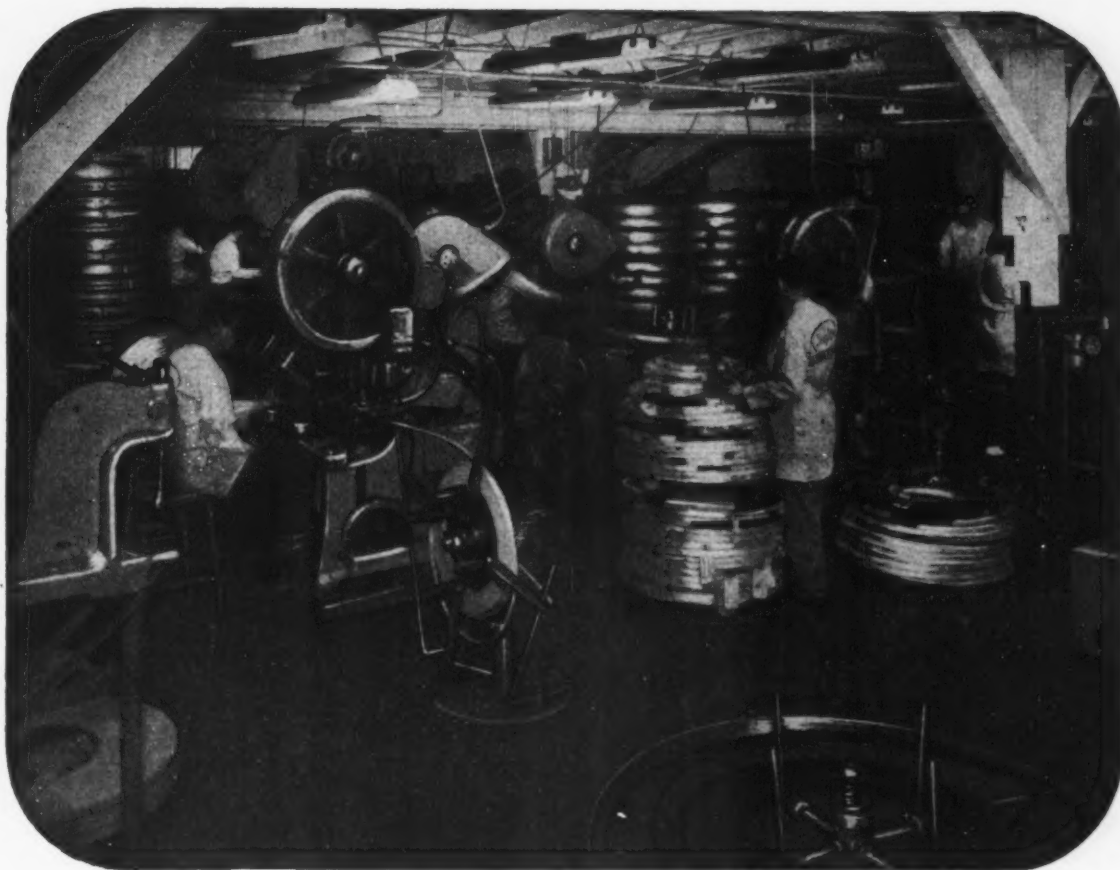
And of course, even routine operations of draftsmen fit right into Sun Ship teamwork . . . for the drawing is a translation of facts into language readable by workers . . . and the "doodles" of structure, fittings, wiring, etc. have put a feather in Sun Ship's cap by helping speed the building of many a machine that helped build a greater America.

Sun
SHIPBUILDING & DRY DOCK COMPANY
SINCE 1916

ON THE DELAWARE • CHESTER, PA.

25 BROADWAY • NEW YORK CITY

FLAT SPRING STEEL



***You can get it now! . . . and we believe it's
the best spring steel we've ever made***

OUR NEW specialty spring steel plant is in full swing. Equipped with today's most modern, precision machines, we believe we're producing flat spring steel that gives more for your money than ever before.

This new spring steel is tops in uniformity. It saves you preparation time . . . cuts down machine

stoppages . . . gives you the greatest number of perfect parts from every foot and pound of steel.

With our greatly increased capacity we can make prompt deliveries on flat spring steel. And if you need high carbon round or shaped wire, ask what we can do. John A. Roebling's Sons Company, Trenton 2, N. J.

ROEBLING

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This
BALDWIN-
Westinghouse
DIESEL
is always
on the job
...97%
availability!

Typical of the exceptional reliability and availability of Baldwin-Westinghouse industrial diesel locomotives is a report from one of the largest pipe and tube manufacturers in the country.

In this big plant a 50-ton Baldwin-Westinghouse diesel-electric delivers charging buggies to the open hearth floor and ingot molds to the soaking pits and rolling mill . . . handles loads of more than 150-tons smoothly and quickly.

Though in service 24 hours a day, seven days a week, this Baldwin-Westinghouse diesel-electric requires only 16 to 24 hours a month for refueling, cleaning and routine inspection . . . an amazing 97% availability!

In addition to these obvious savings in time and maintenance, Baldwin-Westinghouse locomotives offer lower operating costs, greater safety, cleaner operation, extra power and flexibility. If you are interested in greater switching economy and improved haulage operations, you'll find it will pay to let us show you how a Baldwin-Westinghouse can solve your problems.

Baldwin-Lima-Hamilton Corporation

Philadelphia 42, Pa. • Offices in Principal Cities

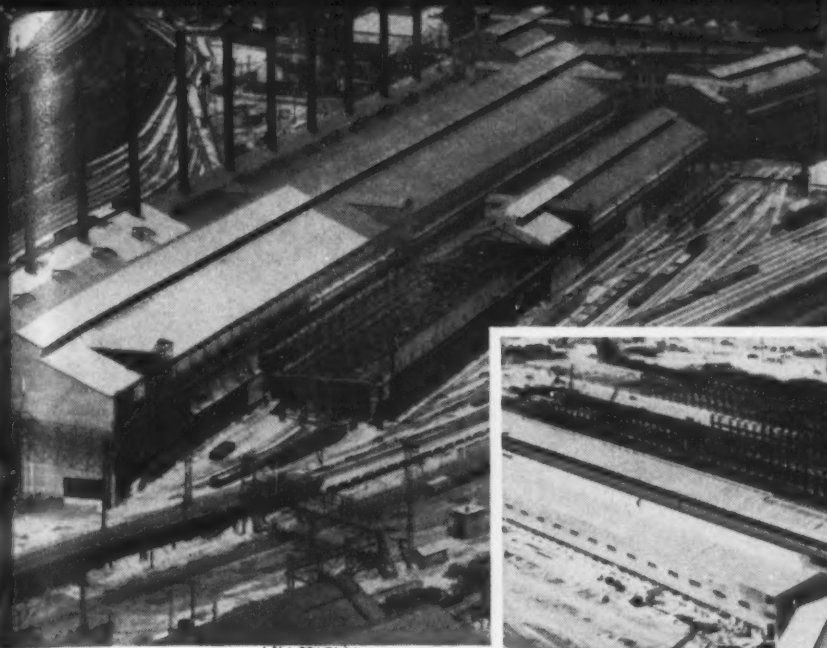


The complete Baldwin line includes locomotives from 5 to 177-tons for all classes of service.



BALDWIN-Westinghouse

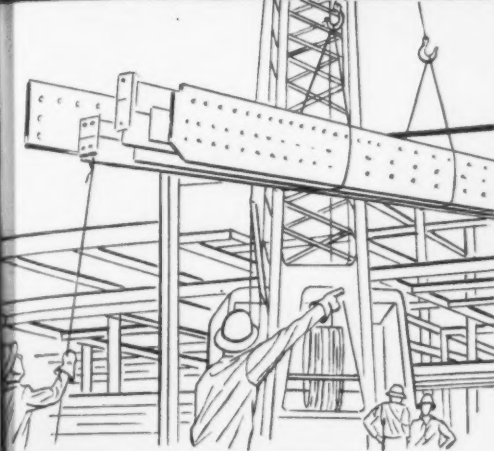
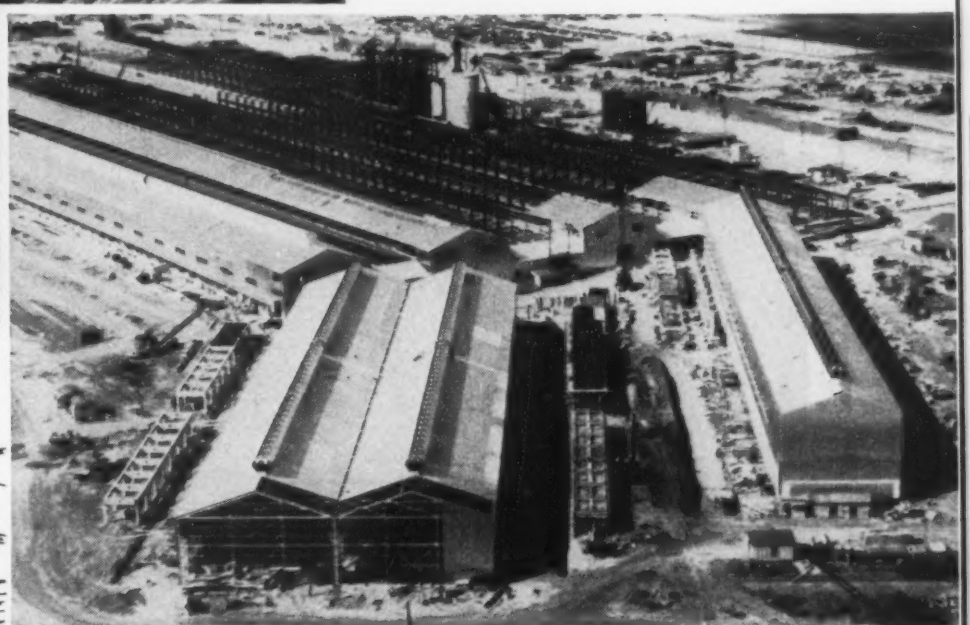
DIESEL-ELECTRIC LOCOMOTIVES



JONES & LAUGHLIN STEEL CORPORATION'S multi-million dollar expansion project on Pittsburgh's South Side.

• • •

REYNOLDS METALS COMPANY, San Patricio Plant, Corpus Christi, Texas, for increased production of aluminum.



**Major Industrial Buildings
for Metals Production
Recently Fabricated and Erected
by
AMERICAN BRIDGE**

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COMPANY**
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- **REPUBLIC STEEL
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Cleveland, Ohio
- **UNITED STATES STEEL
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Fairless Works
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AMERICAN BRIDGE
Lends a helping hand
as nation's essential industries continue to expand!

LESS spectacular than city sky-scrapers, but just as important to our nation's defense and economic growth, are the unheralded industrial buildings which have been built or are now under construction all over this great country of ours.

Of the thousands of such steel-frame structures built by American Bridge, we are perhaps proudest of those we have done, or are now working on, for vital industries. Included in this group are many important metal producers.

To be selected by these leading steel

and aluminum producers is a splendid tribute to the engineering, fabricating and erecting know-how of the American Bridge organization.

It is also your assurance that American Bridge has the fabricating facilities, erecting equipment and skilled personnel to handle any type of steel-frame construction with exacting precision, thoroughness and speed . . . any time, anywhere.

If you would like to know more about the advantages of American Bridge fabricated and erected steel construction, call our nearest office.

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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

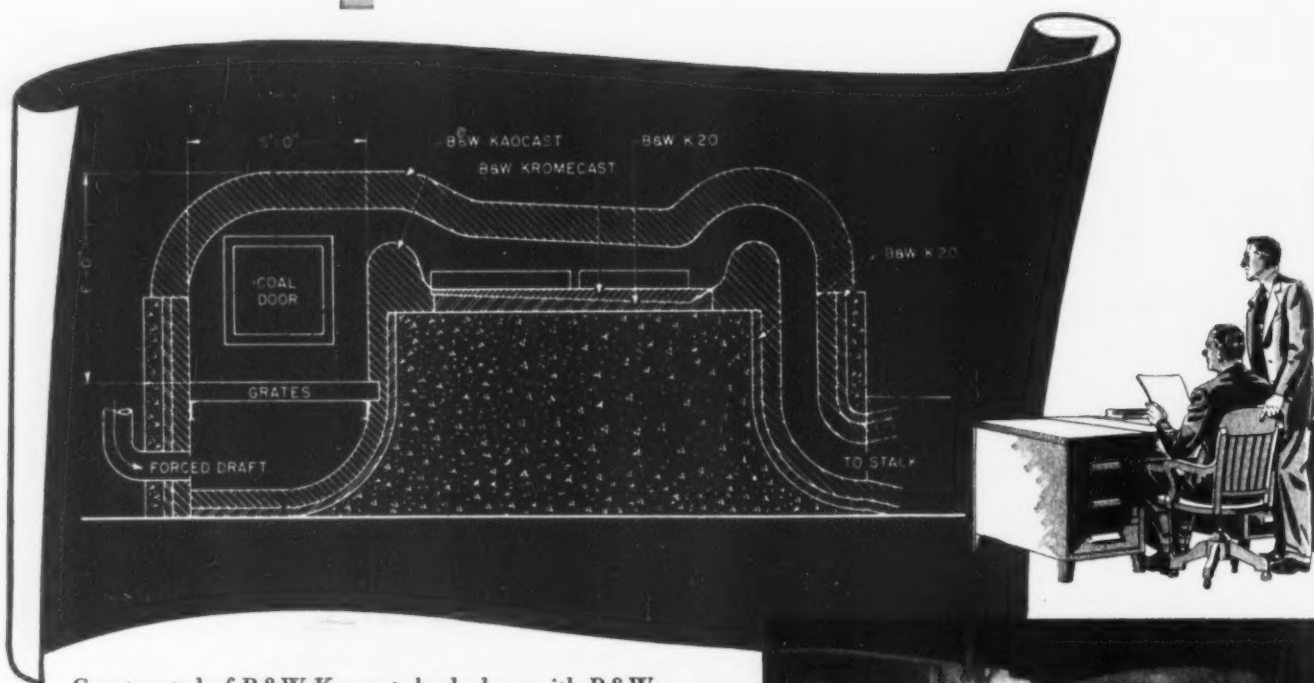
AMERICAN BRIDGE



UNITED STATES STEEL

*Catawissa
Valve & Fittings
Company*

BUILDS COMPLETE FURNACE *with B&W Refractory Concretes*



Constructed of B&W Kaocast, backed up with B&W K-20 Insulating Concrete-Mix, and with a hearth of B&W Kromecast, this forge furnace had to stand up under these tough "stop-and-go" conditions:

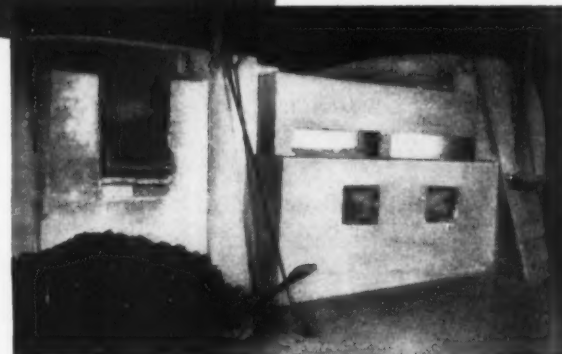
- Operated only 8 hours a day
- Shut down over week-ends
- Coal-fired forced draft with a pressure of 14 ounces
- 2650 F and higher temperatures

Heating 125 lbs of steel per square foot of hearth area per hour to a temperature of 2300 F, Catawissa found the furnace took this punishing service so well that they built another one to the same specifications.

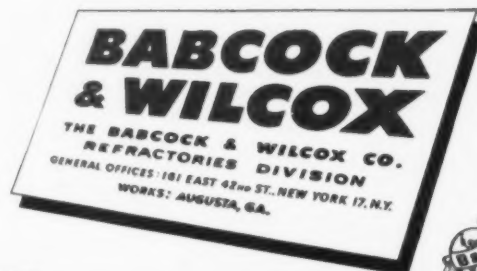
Quality control was also improved due to the elimination of inclusions in the forged steel products.

There are good reasons for the excellent performance of these B&W Refractory Concretes. Kaocast, a 3000 degree refractory castable, has high resistance to spalling and slag attack. It offers low volume change and negligible reheat shrinkage. Versatile Kaocast can be molded quickly, easily cast directly in place or applied with a cement gun.

B&W Kromecast provides the necessary resistance to abrasion, to the effects of molten metal, and to slag attack which are so necessary for a forge furnace hearth. The insulating properties of B&W K-20 Insulating Concrete-Mix protect the exterior ordinary concrete lining and hold temperatures down to such an extent that the outside of the furnace can be touched with a bare hand.



These are some of the reasons why B&W Refractory Concretes are being used in so many thousands of applications. Whether you need a whole furnace lining or small special shapes, it pays to investigate B&W Refractory Concretes.



**B&W REFRACTORIES PRODUCTS: B&W ALLMUL FIREBRICK • B&W 80 FIREBRICK • B&W JUNIOR FIREBRICK
B&W INSULATING FIREBRICK • B&W REFRACTORY CASTABLES, PLASTICS AND MORTARS**

How **concave sides** cut **V-Belt costs**

Important to anyone who wants to cut V-Belt replacement costs is the simple, interesting reason **WHY** Gates Vulco Ropes are built with *Concave Sides* (U. S. Patent 1813698). See Figure 1.



Fig. 1



Fig. 1-A

When a Gates belt is bent around a sheave these Concave Sides fill out to full, even contact with the sides of the sheave groove. (Figure 1A). This gives you sure pulling power. And, naturally, because wear is distributed evenly, the Concave Sides actually give you longer wear—longer belt life. That cuts V-Belt replacement costs.



Fig. 2



Fig. 2A

On the other hand, when a straight sided V-Belt (Figure 2) is bent, the sides bulge out, preventing the belt from fitting evenly in the sheave groove. This causes *extra wear* at the points shown by arrows. (Figure 2A).



Make this simple test yourself...

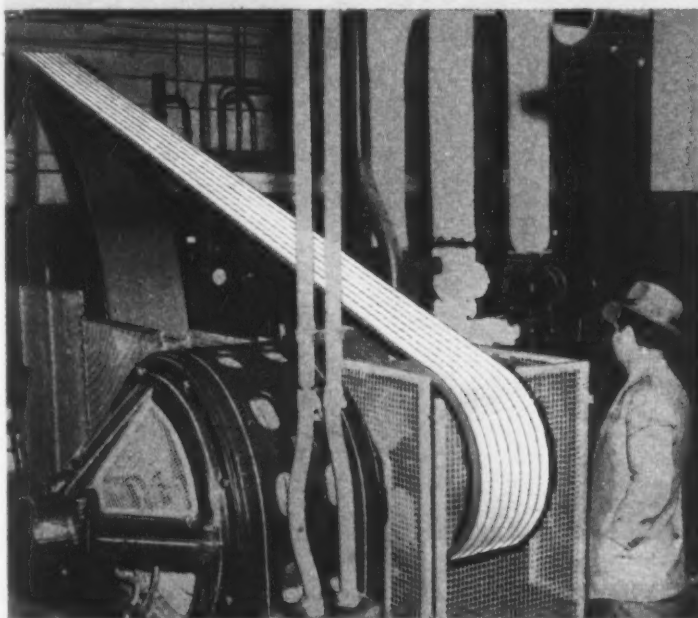


Hold a straight sided V-Belt as it would be bent around a sheave. Take the sides of the belt between your finger and thumb. You can *feel* the bulges in the sides—the bulges that prevent an even fit in the sheave groove and cause extra wear.

Now do the same thing with a Gates Vulco Rope. You can feel the sides fill out. You can see why they press firmly and evenly against the sides of the sheave groove—giving you longer belt life—lower belt costs.

When you buy V-Belts be sure to get Gates Vulco Ropes—the V-Belts with the Concave Sides.

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.



SAVING \$1,000 A YEAR

This big 18 foot flywheel on an ammonia compressor at the Terminal Warehouse Co., St. Joseph, Missouri, was originally driven by a flat belt.

Mr. I. McKee, plant superintendent says, "We needed a drive we could depend on, so we installed a Gates Vulco Rope drive right on the flat pulley of the compressor. This conversion is saving us about \$1,000 a year."

CS-526-A

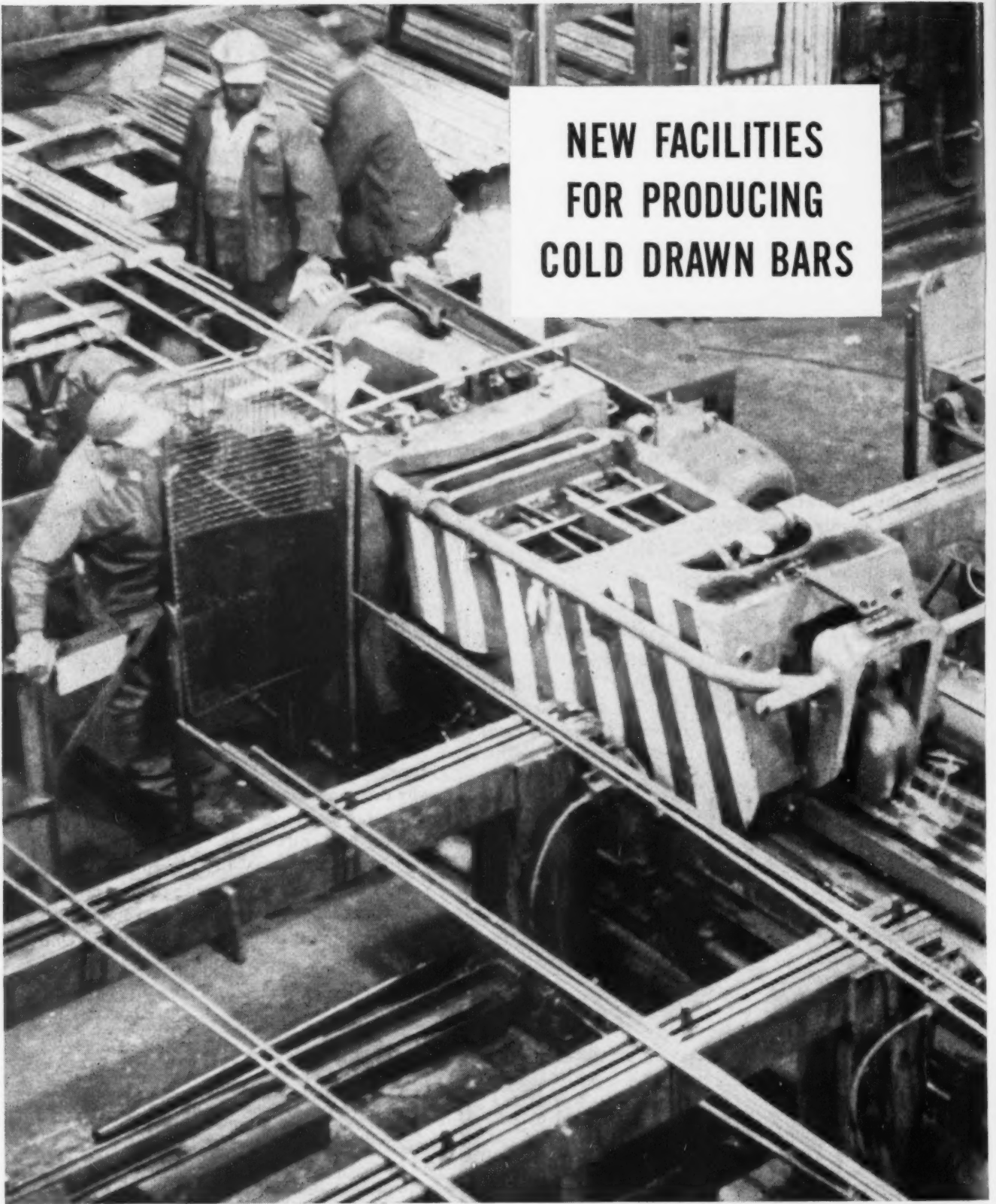


VULCO
ROPE

DRIVES

THE GATES RUBBER COMPANY • DENVER, U.S.A.

V-Belts — Hose
Molded Rubber Goods
for industry
World's Largest Maker
of V-Belts



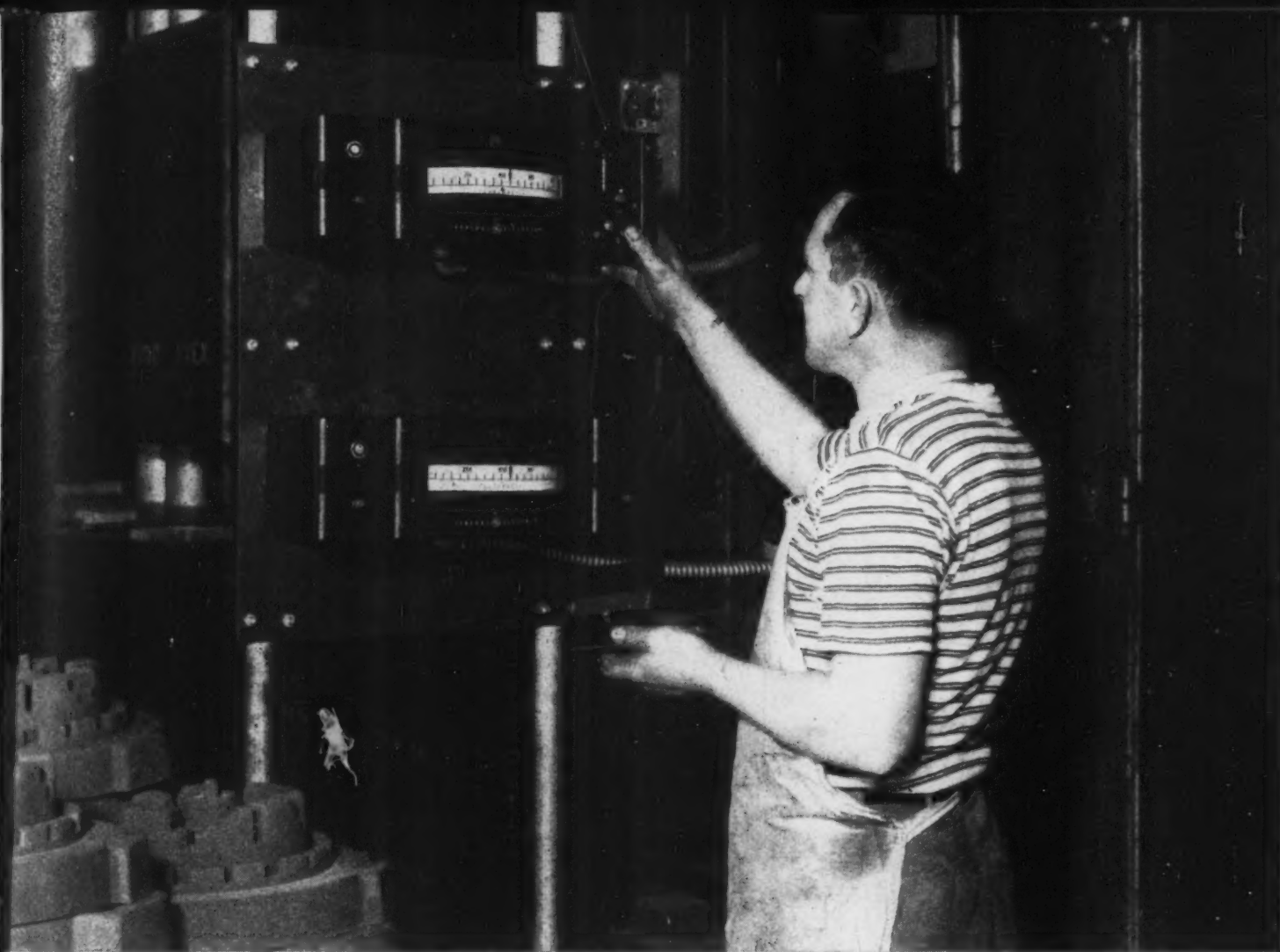
**NEW FACILITIES
FOR PRODUCING
COLD DRAWN BARS**

WISCONSIN STEEL COMPANY

AFFILIATE OF THE INTERNATIONAL HARVESTER COMPANY

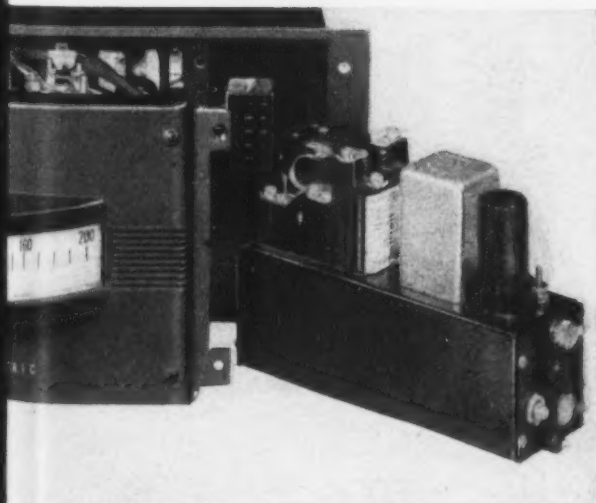


180 NORTH MICHIGAN AVENUE • CHICAGO, ILLINOIS



OPERATOR RESETTNG PROTECTOR UNIT OF A TYPE HP-3 PYROMETER PROTECTOR WHICH IS USED TO PROTECT A DRY-MOLDING OVEN.

G-E Pyrometers Protect Sand Molds from Overheat Damage in Eastern Iron Foundry



PROTECTOR UNIT is readily accessible for maintenance checks. Merely remove cover and pull out. Standard oscillator tube is shown above on right end of unit.

A large eastern iron foundry is currently using two General Electric Type HP-3 pyrometers as protectors for their dry-molding ovens to prevent ovenheat damage to sand molds. In the event of a controller failure that would allow the temperature of the ovens to increase, these protectors immediately shut down the oven, thus saving the molds in process.

RESISTANCE TO VIBRATION of these G-E pyrometers is essential in this operation. Roll-over rammer machines, used for pressing sand into core boxes, and an overhead crane are located nearby. Yet, the pyrometers have operated continuously, with only normal servicing, since they were installed.

LOWER MAINTENANCE EXPENSE is also obtained from G-E pyrometer equipment. The plug-in protector unit and standard oscillator tubes are features which permit easy maintenance and cut replacement time.

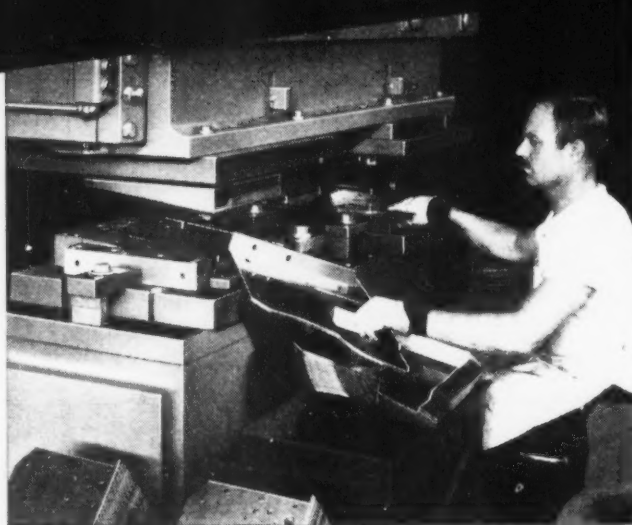
MORE INFORMATION available from your G-E representative, or write for Bulletin GEC-713. G.E. also offers a complete line of resistance thermometers—described in GEC-835. Write Section 602-247, General Electric Co., Schenectady 5, N. Y.

GENERAL  **ELECTRIC**

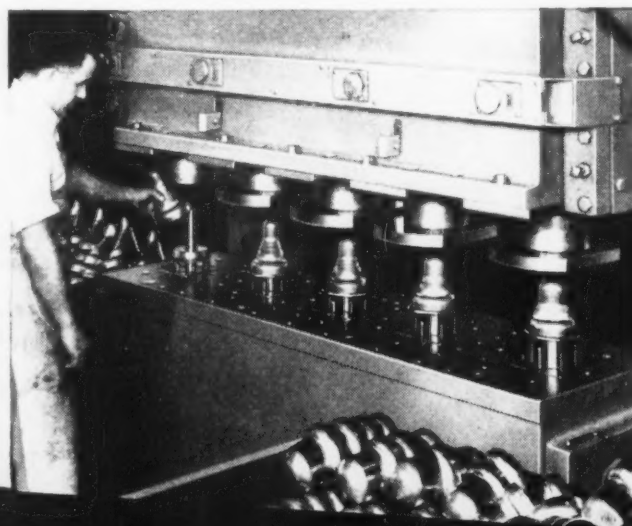
NIAGARA

SERIES B GAP FRAME Double Crank Presses

Niagara B-4 x 72 Press at the General Machine Works in Los Angeles. It is shown here fitted with two dies for forming operations on an automatic deflector.



The same press as shown above arranged with dies for redrawing projectile parts in 5 steps. Shells are transferred manually from die to die.



NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

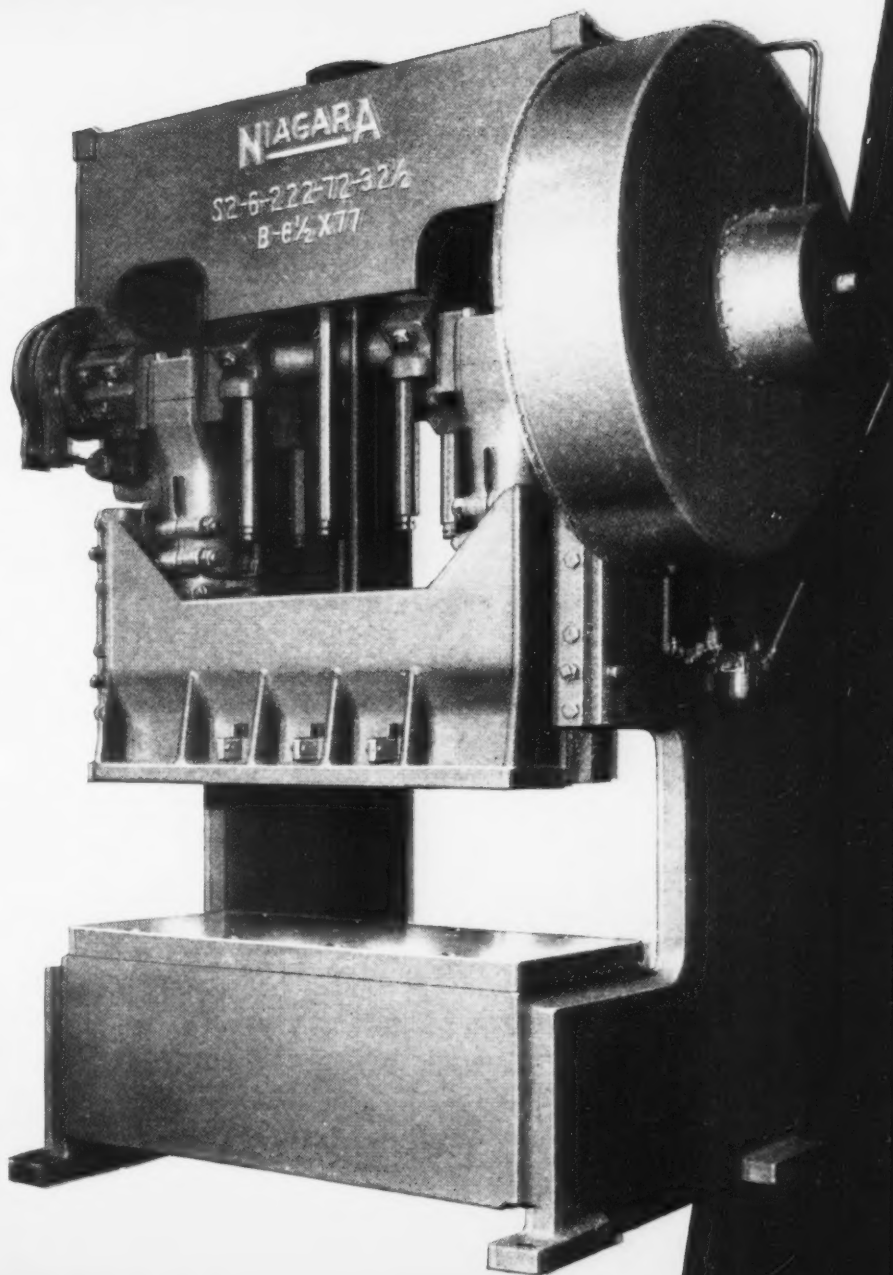
* *Manufacturers of a complete line of sheet metal working equipment ranging from small hand tools up to large power operated machinery.*

Versatility and High Production

- Gap frame convenience with double crank width.
- Ideal for long progressive dies or multi-station dies.
- Rear of press open for full accessibility.
- One piece welded steel frame for maximum rigidity and long die life.
- Exclusive Niagara Sleeve Clutches for maximum productive strokes per minute and minimum maintenance cost.
- Niagara cushions for drawing operations.
- Automatic feeds for high production jobs.

Write for Bulletin

Niagara B-6½ x 77 Gap Frame Double Crank Press. Air actuated, electrically controlled sleeve clutch with friction clutch convenience and sleeve clutch economy. Air releasing brake. Clutch and gearing operating in a bath of oil. Air counterbalance for slide with surge tank over-size cylinder and pressure regulating valve to compensate for various weights of dies. Cross bar knockout in slide. V-belt motor drive.



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STANDARDS and SPECIALS by the Millions

THE FERRY CAP & SET SCREW CO.

2157 SCRANTON ROAD • • • CLEVELAND 13, OHIO



"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 95,000-110,000 p.s.i. Carried in stock.



"LO-CARBS"

Made of AISI C-1018 steel — bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength 75,000-95,000 p.s.i. Carried in stock.



FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.



"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.



CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.



FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.



SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.



FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.



ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications — hexagon head hard; polished if specified — threads soft to close tolerance — points machine turned; flat and chamfered.



SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.



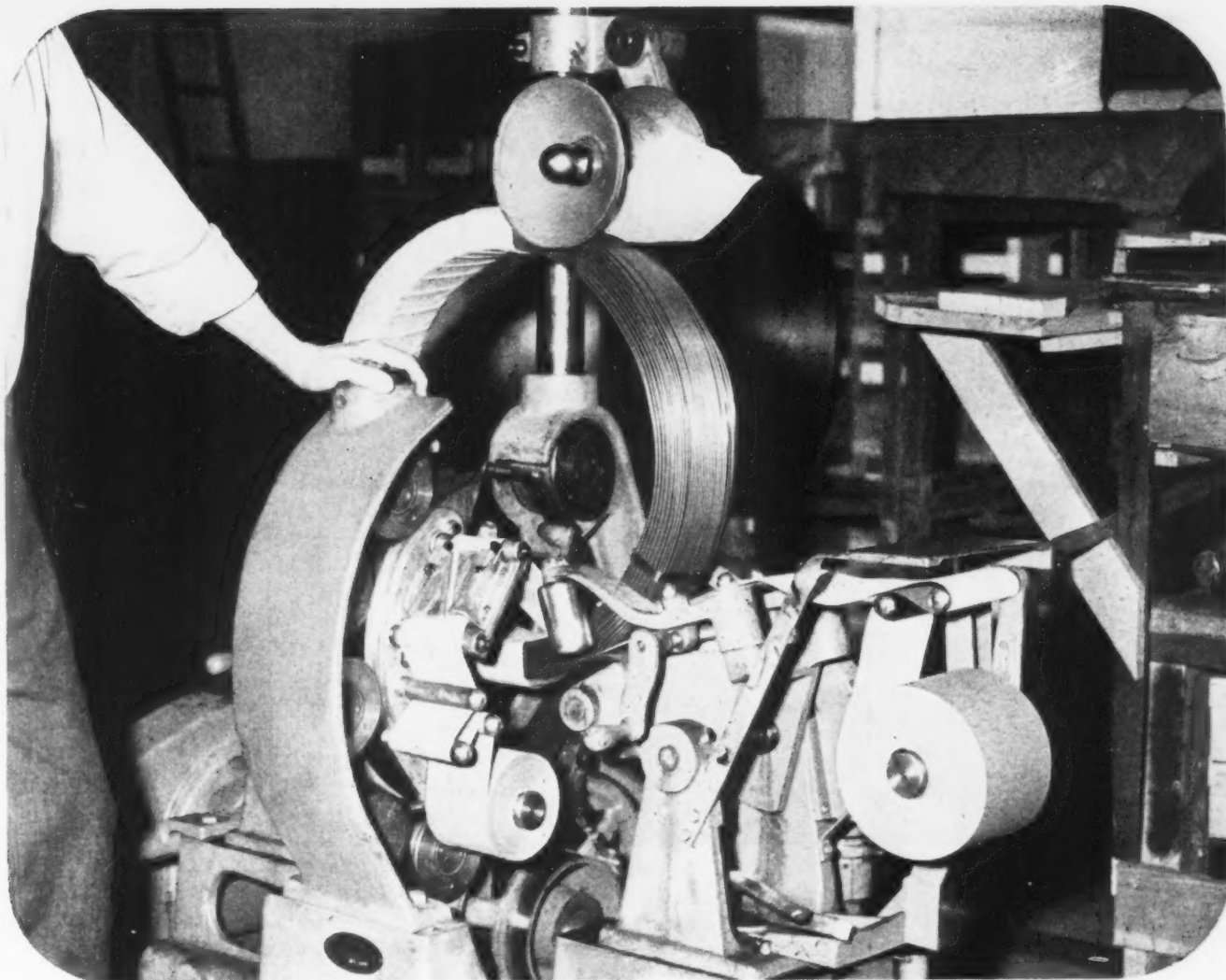
STANDARDS
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SPECIFICATIONS

**WRITE FOR
INFORMATION**

SEND FOR SAMPLES

Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907



Shell "VPI" Peripheral Wrap as applied to a coil of hard-facing alloys . . . saves expense of removing rust-preventive material . . . reduces packing costs.

New packing technique HALTS RUST DAMAGE ... cuts packing costs as much as 60%

THE GOOD WORD AMONG steel packagers and shippers today is that rust can now be prevented by Shell VPI® (a volatile corrosion inhibitor). Composed of solid amine nitrites, Shell "VPI" vaporizes and when moisture is present in the air . . . renders this moisture non-corrosive. Containers need not be airtight, however, for excellent corrosion protection.

In terms of packing costs, this new technique is so much simpler and faster that costs have been cut as much as 60%.

This can be traced directly to the fact that Shell "VPI" may be applied quickly

and easily in either crystalline form or as a coating on wrapping paper. Hence rust-preventive measures are greatly simplified and container costs are reduced. And, of course, rust removal before the product's use is unnecessary.

Other major advantages of Shell "VPI" are: Low cost . . . Long periods of volatility . . . Non-toxic . . . Elimination of greasing and degreasing . . . Harmless to plastics or ferrous metals.

Consult your Shell Representative about this new method of rust prevention today. Or write to nearest address listed below.

SHELL OIL COMPANY

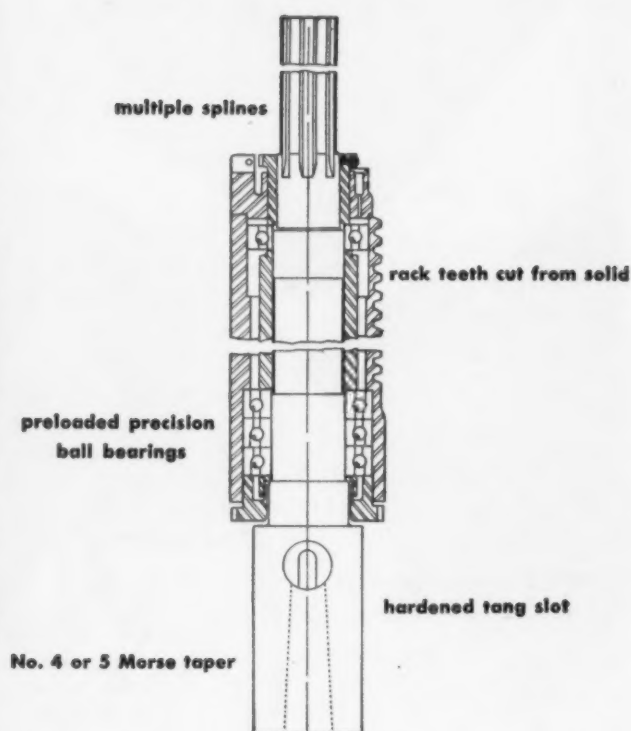
50 West 50th Street, N. Y. 20, N. Y.
100 Bush Street, San Francisco 6, Calif.



SHELL "VPI"

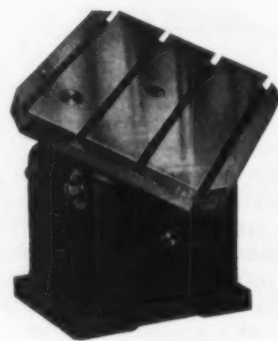
(a volatile corrosion inhibitor)

stops air and moisture from making rust.



ACCURATE / FLEXIBLE

Cincinnati Gilbert spindles stay right on the "O" even under the strain of improperly sharpened drills, uneven depths of cut, as well as normal thrust loads of feeding. The heavy $4\frac{1}{4}$ " OD alloy steel quill has a 12-inch long bearing in the head, and the spindle is mounted in the quill with three ABEC No. 5 precision preloaded angular contact ball bearings at the bottom and one at the top . . . Take full advantage of your radials and boring mills with the added flexibility of Cincinnati Gilbert Universal Tables. Just one setup enables you to drill, tap, etc., five sides of the work up to 90° . Four point support in the horizontal position assures maximum rigidity, no strain on the worm . . . In the photo above the operator drills and taps a total of 35 holes, on five faces of the casting. Write for Bulletin 850.



RADIALS
HORIZONTAL BORING MILLS
ACCESSORIES

THE CINCINNATI
GILBERT
MACHINE TOOL COMPANY
3366 BEEKMAN ST. • CINCINNATI 23, OHIO

THOSE WHO BUY GILBERT BUY GILBERT AGAIN

Here's what we mean by **SUPERIOR** ENGINEERED FOUNDRY PRODUCTS...

PROBLEM:

1. Designed as a weldment from thirteen pieces of steel plate, the rockers and stop brackets for an End Dump Hopper were too expensive to produce.
2. The weldment design required right and left hand parts, adding materially to cost of finished product.
3. Welded construction caused high machining costs, strained the capacity of customer's machine shop.
4. Weight, an important factor in this type of material handling equipment, was 117 lbs.

OUR SOLUTION:

1. Foundry Engineered Design one-piece cast steel rockers and brackets would cost less, could be readily welded in place in final assembly.
2. Foundry Engineered Design would insure complete interchangeability of the parts and they could be produced from relatively inexpensive pattern equipment.
3. Foundry Engineered Design would eliminate all machining since the holes for the track pegs and bolts would be accurately cored.
4. Foundry Engineered Design would reduce weight, insure metal distribution for greatest strength where needed most.

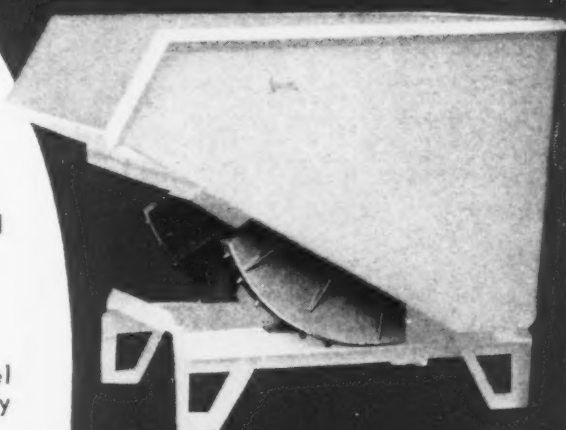
RESULT: 23.4% SAVINGS

1. A saving to our customer of \$5.48 per hopper, as compared to the weldments.
2. The cast steel rockers and stop brackets are completely interchangeable, eliminating necessity for right and left hand parts. They are longer-lived, have greater eye-appeal.
3. Accuracy of the steel castings has eliminated machining and misfits, enabling customer to increase production rate of completed hoppers.
4. Weight reduced 8.55%, better weight-strength ratio.

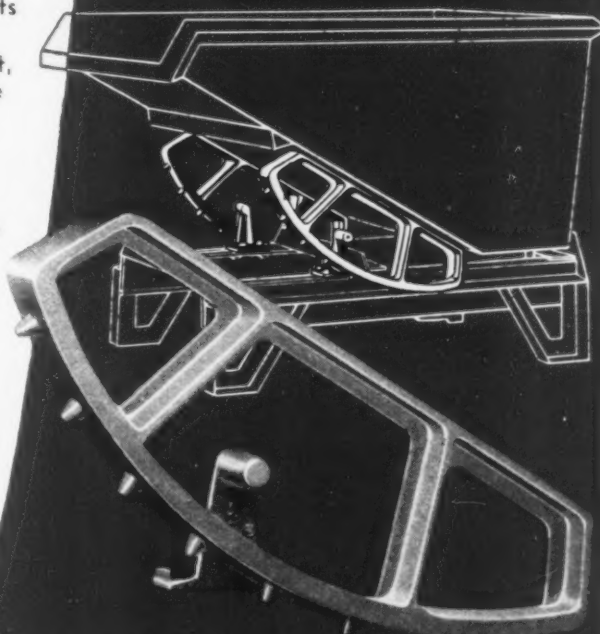
TOTAL COST OF PART REDUCED 23.4%

**YOU, TOO, CAN GET SAVINGS LIKE THESE!
CONSULT OUR PRODUCT DEVELOPMENT SECTION REGARDING YOUR PROBLEM... WHILE IT'S STILL ON THE DRAWING BOARD.**

Let our foundry engineers help you conserve critical materials.



ORIGINAL DESIGN



MODIFIED DESIGN

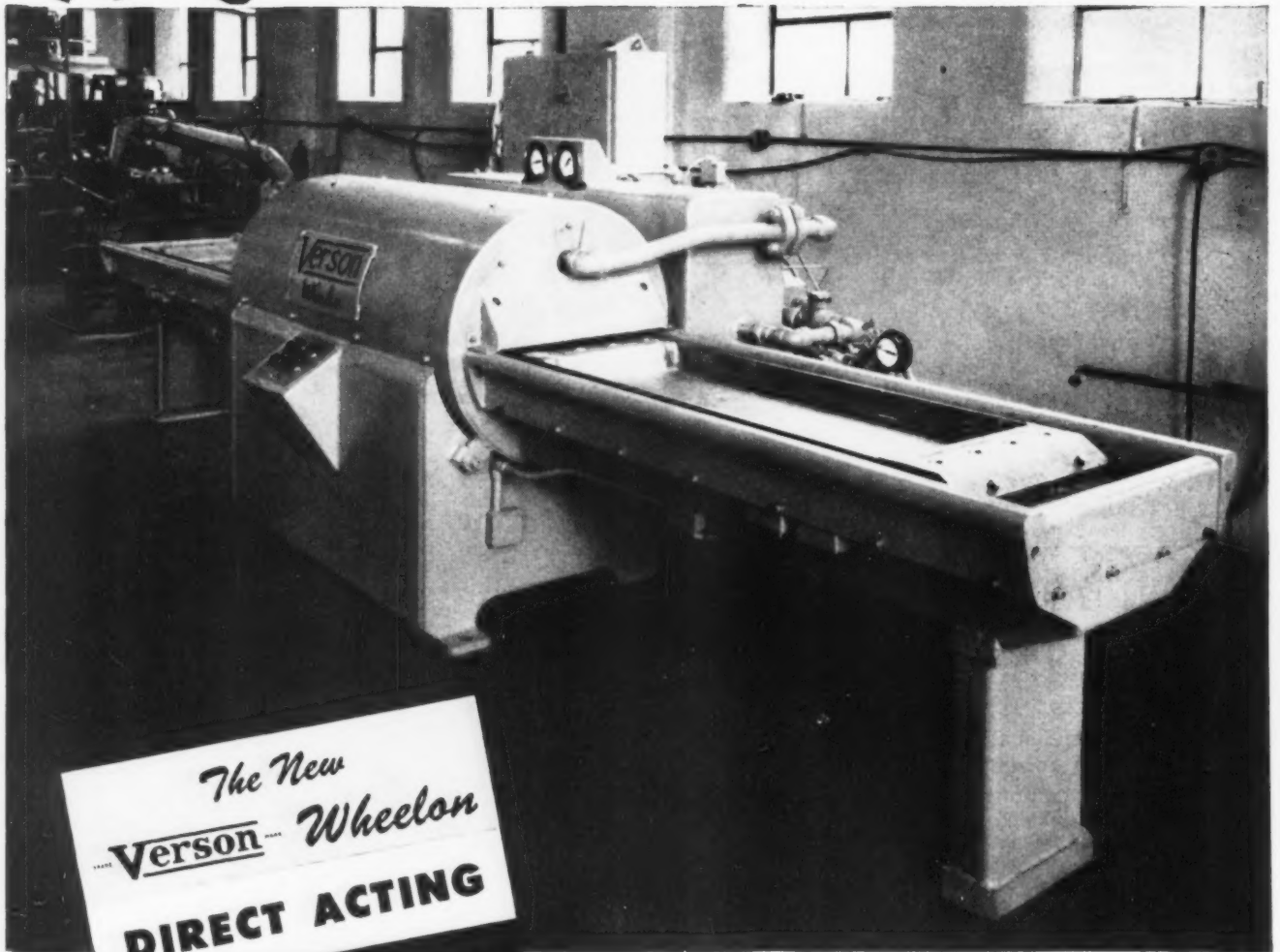
Photos courtesy of Brummeler Steel Products Corp.



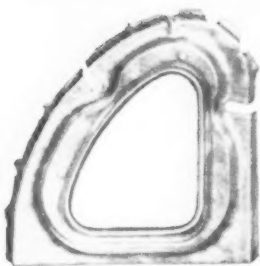
SUPERIOR STEEL AND MALLEABLE CASTINGS CO.

BENTON HARBOR, MICHIGAN, U. S. A.

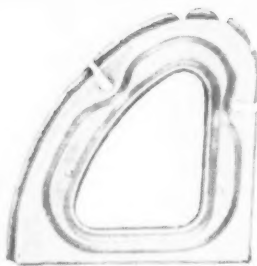
YES—this is a 2500 ton press...



The New
Verson-Wheelon
DIRECT ACTING
Hydraulic Press



Formed in a conventional
rubber pad press.



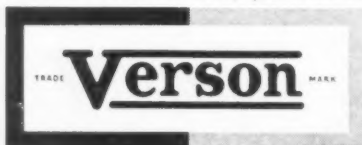
Formed in a
Verson-Wheelon press.

To meet the demand for a more efficient, more economical method of rubber pad forming of metal, Verson now offers the Verson-Wheelon Direct Acting Hydraulic Press. With this revolutionary new method, it is possible to exert forming pressures many times as great as the practical maximum with a conventional rubber pad press. The small press above, for example, operates at 5000 psi, equivalent to a rated tonnage of 2500. The photos at the left show the superior forming detail.

The advantages of the Verson-Wheelon method are—complete forming of flanges, eliminating hand finishing... lower first cost... elimination of expensive machine foundations... minimum plant space requirements.

Write for bulletin VW-52 which gives further details.

A Verson Press for every job from 60 tons up.



ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

VERSON ALLSTEEL PRESS CO.

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MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • Verson-WHEELON HYDRAULIC PRESSES

THE IRON AGE Newsfront

SHELL MOLDING PATENT RIGHTS are being claimed by the British. Polygram Casting Co., Ltd., claims "these patents apply not only to mechanical inventions issued to Polygram but to some basic features of the shell molding process itself."

TO CONSERVE ALLOY, the 4000 series of "Amola" steels has been restricted in civilian use. Recently some tonnage of resulfurized 4000 series moly steels was released for automotive use.

TWO NEW LINES for Sendzimir process galvanized sheet are definitely on the books for late 1953 and 1954. A Canadian company has already made space for such an installation, and a second line will be installed in the Midwest.

STAINLESS STEEL of the 17 Cr, 4 Ni, 6 Mn grade can satisfactorily replace many present 18-8 applications. The military could substantially aid nickel conservation if it would switch overgrading of many applications which now specify 18-8. Civilian consumers have been forced to use type 430 and 16 Cr, 16 Mn 1 pct max Ni plus nitrogen grade.

ATOM-DRIVEN ELECTRIC POWER PLANTS will be operating in factories within the next 10 to 20 years, Dr. Paul C. Aebersold, director of the isotopes division of the United States Atomic Energy Commission recently predicted.

HIGH GRADE ORE FROM QUEBEC AND LABRADOR MINES will start flowing into the United States next year. Ore will be brought to smelting cities in the U. S. via a 300-mile railway from Ruth Lake to Seven Islands, down the St. Lawrence River to the Great Lakes. Annual shipment of 10 million tons is planned eventually.

SMALLER AND SIMPLER devices are being designed to remove stampings from a die. Multiple Iron Hands are also being used for some of the larger stampings.

A RELATIVELY INEXPENSIVE oil-fogging device has enabled a large gas company to convert from manufactured to natural gas without extensive modification of existing transmission lines. Due to difference in makeup of manufactured and natural gases, existing mains would not have been useable without artificial "wetting" of natural gas.

SYNTHETIC INDUSTRIAL DIAMONDS from a mixture of molten iron and carbon, prepared with lignin, is the end product claimed for a new process patented in England. Iron of 99.6 pct purity is heated to near volatilization temperature, rapidly cooled to separate out the "diamonds."

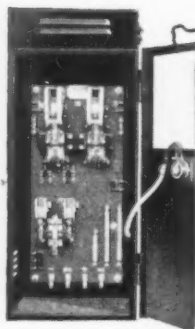
AIR FORCE ISN'T ENCOURAGING SPECULATION on its new jet engine, reportedly more powerful than the Pratt & Whitney J-57. BUT—the new plant may be used to fly the B-52 intercontinental bomber at near-supersonic speeds. Now equipped with J-57's, the plane is credited with a top speed of over 600 mph.

DUE TO THE SWITCH from cast wheels to steel wheels on freight cars, one Midwest railroad will discontinue its captive foundry and become a mill buyer. Studies showed replacement costs, slower speeds made cast wheels a high cost item.

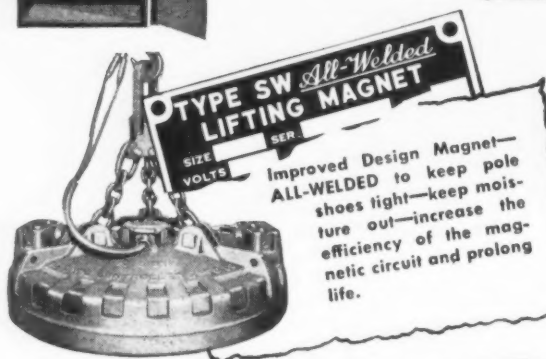
**Raise the PROFIT level—
Cut the Discharge-time
with EC&M MAGNETS and
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Small Master Switch—convenient, compact and only 2 positions "Lift-Drop" simplify operator's motions.



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Improved Design Magnet—ALL-WELDED to keep pole shoes tight—keep moisture out—increase the efficiency of the magnetic circuit and prolong life.



55-inch diam. EC&M Type SW ALL-WELDED Magnet speeds handling of large diameter discs stamped from steel-plate.

WRITE FOR BULLETIN **900** ON IMPROVED EC&M ALL-WELDED MAGNETS



THE ELECTRIC CONTROLLER & MFG. CO.

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CLEVELAND 4, OHIO

FAIRLESS WORKS: Fosters Regional Boom

Delaware Valley expansion approaching \$4 billion, as huge Fairless Works pours first steel . . . Close to 300 separate expansion programs already underway—By W. V. Packard.

Last Thursday U. S. Steel's \$400 million Fairless Works came to life. Two little granddaughters of Chairman Benjamin F. Fairless started operation of the great new plant. Seven-year-old Nancy lighted the first blast furnace, and five-year-old Carol pushed the button that set off the jet-rocket to tap No. 1 openhearth.

Little Carol won rousing applause from the limited gathering of 200 members of the U. S. Steel "family" and the press when she said "I didn't know all you have to do to make steel is press a button."

Big Job—Many of the audience had been present at the ground breaking ceremony less than 20 months earlier (Mar. 1, 1951). Having just completed a thorough tour of the vast plant, they were deeply impressed with the tremendous accomplishment in so short a time. (Fairless Works is the largest integrated steel plant ever built at one time.)

They had witnessed the lighting of the first of two blast furnaces which will produce a total of 1.2 million tons of pig iron per year. They had watched the tapping of the first of nine openhearth which can produce 1.8 million tons of steel. They had seen two batteries of 87 coke ovens each—one of which pushed its first coke two days before. And they had observed other facilities nearing completion which will be able to make 235,000 tons of hot-rolled sheets, 289,000 tons of cold-rolled sheets, 170,000 tons of tin mill products, 285,000 tons of bar products, and 280,000 tons of small diameter pipe.

Vital Statistics—They had also collected other vital statistics so vast as to stagger the imagination: More than 4000 contractors and subcontractors located in 27 states and employing close to 3 million people helped in construction and tooling of the plant. Nearly 10,000 construction work-

Also on hand are stocks of iron ore, limestone, fluorspar and other raw materials of iron and steel-making.

Initial ingot production will be stored pending completion of the 45-in. by 90-in. slabbing and blooming mill and the 80-in. hot strip mill. Cold-rolled strip is being produced on the 5-stand tandem mill from hot-rolled coils shipped from Pittsburgh. Strip annealing and tin temper and recoil lines are also



CELEBRATION: The Fourth-of-July effect is the lighting of Nancy blast furnace by seven-year-old granddaughter of U. S. Steel Chairman Ben Fairless. At left is Nancy's sister Carol, Chairman Fairless, and Gen. Supt. Al Berdis.

ers were directly employed on the site during the peak this year.

The huge mill on a 3900-acre tract on the bend of the Delaware River south of Trenton, N. J., has 75 miles of standard railroad track, 20 miles of roads, 30 miles of sewer, a water-treating plant which will handle 254 million gal daily, and several miles of belt conveyers.

Huge scrap stockpiles, amounting to an estimated 50,000 tons, dominate a great area in the plant.

working, although the electrolytic tinning line is not quite finished. Hot-rolled sheet output is expected in the second quarter, with cold-rolled production a few weeks later.

Valley Expansion — The Fairless Works, along with other nearby steel expansion programs, has brought a new industrial revolution to the Delaware Valley. In addition to added population of workers and their families and



CHRISTENING: Mrs. Fairless gives second blast furnace her name—Hazel.

various supply and service firms, steel consuming plants are building and expanding in the area. It has been estimated that nearly 300 plants are building or expanding in the valley of the Delaware.

No sooner did the news of U. S. Steel's expansion get out than nearby real estate values started shooting to fantastic heights. Spinach fields that had been selling in the neighborhood of \$300 to \$400 an acre started selling for thousands per acre. At least one small parcel is reported to have cost \$75,000 an acre.

Two great housing developments have helped absorb the influx of workers. Fairless Hills, a development of Danherst Corp., is expected to eventually include 6000 Gunnison homes. Nearby Levittown, developed by William J. Levitt of Long Island fame, may grow to three times that number.

People are swarming in both directions, like ants. Some Fairless workers commute from Philadelphia and Trenton. Some residents of Philadelphia and Trenton have taken advantage of available housing in Levittown.

The Scoreboard—Altogether some 300 firms are building or expanding in the valley between Trenton and the mouth of the Delaware. Total expansion cost is estimated at \$3 billion to \$4 billion. Well over \$2 billion of this is being spent directly on new or expanded plants and facilities. There are more than 8000 different manufacturing plants along the 135-mile stretch of the river between Trenton and the sea.

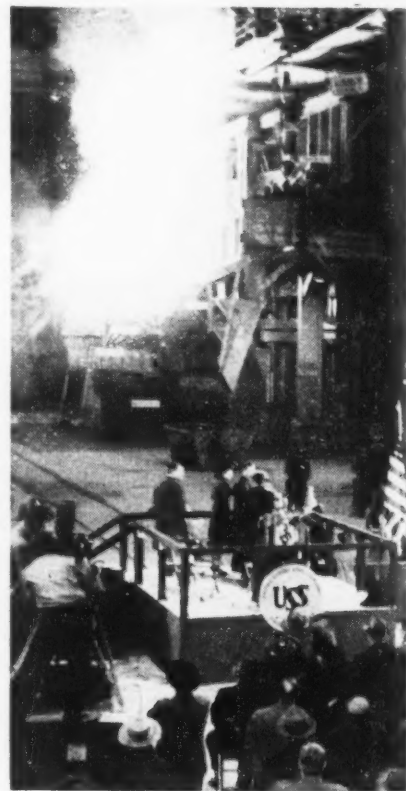
It is difficult to determine how many decisions to expand in the area were influenced by a desire to be near the great new steel plant. Undoubtedly many were. But there are a number of other factors favorable to industrial growth there. Among them are water and rail transportation, easy access to materials, abundant fresh water and power, and proximity to a great, concentrated market.

Transportation—If taken together the ports of the Delaware form the second greatest harbor in the country. During 1950 these ports handled a total of 68 million tons of cargo. Their 1951 volume is placed at 75 million tons. Shipments this year are substantially heavier.

From these ports three major railroads—Pennsylvania, Baltimore and Ohio, and Reading—fan out and connect with rail facilities serving the entire nation. Both the Pennsylvania and Reading serve the Fairless Works. The Reading had to lay 7 miles of track and spend \$1.8 million to make this connection with its New York-Philadelphia main-line.

The majority of expanding plants in the area will get their power from Philadelphia Electric Co. In order to keep ahead of growing power demands, this utility is spending almost as much as the Fairless Works is costing U. S. Steel. A 5-year expansion program will cost about \$375 million.

Expansion Details—Oil companies are expanding their refining facilities at a cost of more than \$200 million. Since World War II the research giant of the valley, du Pont, has spread its scientific



BEGINNING: Carol Fairless watches first steel production after she pushed button to fire jet-tapper.

arms at a cost of nearly \$40 million. Westinghouse is spending nearly \$40 million on expansion of its steam and aviation gas turbine divisions in the area.

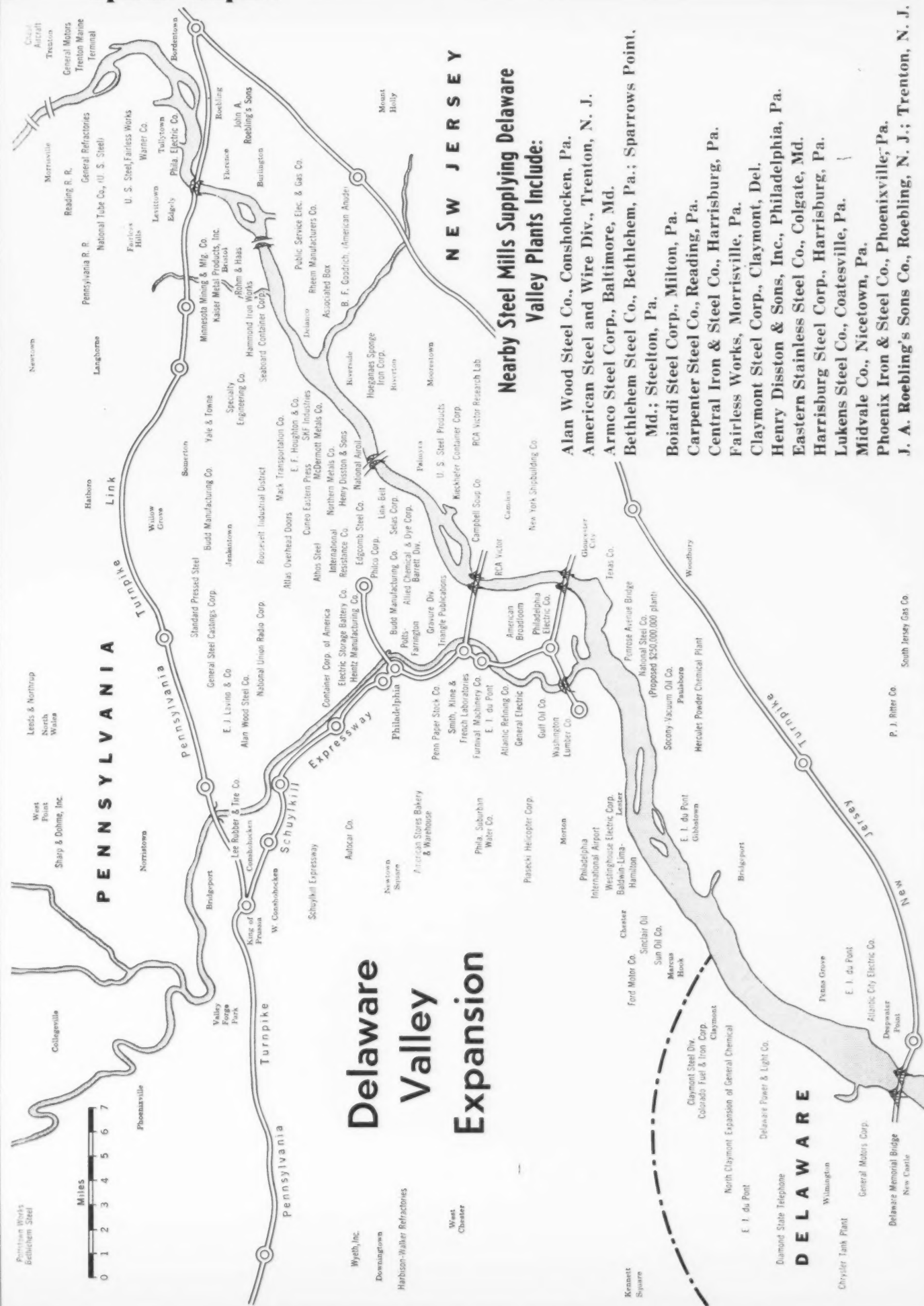
Budd Co. has recently completed two new plants—one is making tank hulls and turrets; the other stainless steel railroad cars.

Standard Pressed Steel is spending \$12 million. General Electric recently completed a \$10 million switchgear development laboratory, and is now working on a \$1.6 million shop and warehouse. Hoeganaes is spending \$4 million on a new iron powder plant.

General Refractories is locating a \$3 million plant almost next door to the Fairless Works. RCA is spending the same amount on an electronic experimental laboratory. Philco recently expanded \$5 million worth. Firestone is spending \$6 million; so is Electric Storage Battery Co. More than \$9 million is being spent on expansion by SKF Industries.

These, and many other expansion projects may be located on the accompanying map.

-Special Report



STRUCTURALS: Demand Stays Strong

Fabricators' outlook for the coming year is excellent . . . More bridge jobs coming than ever before . . . Higher building costs scuttle some investment projects—By R. L. Hatschek.

"We'll have bridges coming out our ears," said one fabricator. And he's right according to the number of jobs coming up and the tonnages involved in some of them. Outlook for construction of schools, hospitals and other institutional buildings is almost as bright. But the picture on industrial expansion programs, office buildings and apartment houses may be another matter.

According to fabricators, 1953 will be the best year in history for bridges. Some say there will be more than the fabricators can handle. A list of some of the projects coming up tends to confirm this opinion.

Highway Jobs—Here are some of the jobs that will be eating up huge tonnages of structurals, plate and reinforcing bars: Extension of the Pennsylvania Turnpike to the Delaware River, New York State Thruway, Garden State Parkway, Schuylkill Expressway, Ohio State Turnpike, and the Indiana Turnpike.

All these will take bridges. The Hudson River crossing of the New York Thruway at Nyack will require approximately 65,000 tons of steel. A bridge is to be built from Philadelphia to Gloucester, N. J. Several are to be built across the Mississippi River. It extends all the way to the Pacific Coast where the Richmond-San Rafael bridge in California will take something like 40,000 tons of steel. Bids on this job are due Dec. 19.

Non-bridge building outfits won't fare quite as well but the demand is high for more school buildings for education of the big crop of kids just starting. More hospitals are needed. Jobs like these and other institutional projects are being designed and released—with even more in the planning stage.

Re-Study—But management is going slow on investment projects such as industrial expansions, apartment houses and office buildings. Many of these jobs have been in the planning stage for a long time. And now that steel is showing signs of loosening they are being dusted off for review. Trouble is that cost estimates have climbed while blueprints were in pigeon holes and some projects would no longer show the kind of profit necessary to make the risk worth while.

Here's a sample: Cost studies show an office building in Washington would make reasonable profits. But a similar study for a project built from the same plans in Philadelphia shows it no longer a profitable venture for that city. That's how jobs evaporate.

Work on this type of project is definitely limited and fabricators are competing sharply for it. Bidding is keen. One fabricator, who says his firm consistently enters "average market" bids, is inevitably undercut by others.



"Normally, Sanders, I'd suggest 10 pct as a scrap factor, but knowing your company."

Defense Work—Air Force hangars, Ordnance depots, warehouses and so on—have been tapering off a bit lately. Interesting to note is a trend by the military to specify timber trusses for warehouses in an attempt to get jobs done faster and save some steel at the same time.

Initial costs and probable returns are still the prime determining factors in choosing between structural steel and reinforced

Construction inquiries, and awards on p. 88

concrete design. But many government and institutional projects have specified the latter in an effort to conserve steel. Tightness in cement has slowed this trend, though. Cement is tight enough to force at least one big outfit to ration it to various projects. One cement supplier is filled through 1953—and still won't have enough for all jobs.

Backlogs—Delivery on structurals is extended about 9 months on the average. Straight beam work takes 6 to 7 months if fabricators have some material in inventory. On the more complicated types of bridge construction, delivery requires up to a year. Reinforcing bar backlogs are reported at about 6 months but delivery can be faster depending on the tonnage involved. Joists ordered now will arrive in June or July.

General expectation is that structurals will ease sometime in the third quarter, somewhat after most other steel items come into market balance. With a heavy trend toward plate girder type construction, many feel that complete easing of construction steel must await better supplies of heavy plate. This they expect after the supply of structurals becomes freer.

Despite the fact that not many buildings are going up now, architectural engineers are busy—and their efforts will be needing steel in the future. It all adds up to what looks like an excellent construction year in 1953.

PLASTICS: Auto Die Use Growing

Carmakers find new, specialized uses for plastic dies . . . Not all disclosed . . . Short runs, luxury models, pilot production seem most promising fields—By R. D. Raddant.

Plastic dies are easing their way into what may be a permanent position in the auto industry.

While even the most ardent advocates aren't ready to predict they will be used for the million-strike dies of high production lines, specialized uses are being found every day.

In these days of comparative infancy of plastic dies, the Big Three and some independents are already using them in different phases of production. Not every use of plastic has been tipped off to the public but some of them have been disclosed or leaked out.

The most highly publicized usage is at Dodge Truck where plastic dies are being used for panels on 100-ton presses.

Luxury Goods—Fisher Body has used plastic dies for the Buick Skylark, the sports cars which will be made in only limited production. This opens a wide field with other manufacturers of limited production models in the luxury class. Packard's interest may indicate that some of this company's new luxury cars may be stamped out on plastic dies.

Ford is believed to have built prototypes of its entire 1953 series of cars on plastic dies. Some sources believe that this type of production will give plastic dies their greatest use. A plastic die can be repaired in a matter of a few hours, a big advantage over the zinc alloy dies commonly used in the industry. Cost is about 40 per cent less.

Standby — Another new use turned up in Mercury production where a steel hood die needed repair. A plastic die was immediately cast and substituted satisfactorily without loss of production while the steel die was repaired.

Checker Cab, with its smaller

production, is also using plastic dies in some of its operations.

Plastic dies are limited to runs of several thousand although at least one has been used for more than 20,000 strikes. With repair they may go as high as 50,000.

Length of the run is a strict limitation on use. Even though plastic dies are less expensive than steel, their cost is high enough to prevent the use of several plastic dies during a run where one steel die would do.

Not New—Plastic dies are not a new idea. Some that were made for the aircraft industry in 1944 are still in use. Early obstacles were slow curing, which formerly required about 8 days, and a

tendency to change shape during curing. Both of these have been overcome in recent years.

George C. Adams, staff engineer of Rezolin Inc., Los Angeles, indicated that his company, producer of Rezolin "8000" tool plastic, is looking to redoubled business in the auto industry in 1953.

Mr. Adams points out that the latest plastics show a negligible dimensional change during the transition from liquid to solid. Thermal expansion is virtually the same as mild steel and not much different from that of cast iron. This enables use of these materials in combination providing additional strength and resistance to erosion.

Convair Plans Supersonic Bomber

Consolidated Vultee Aircraft Corp., San Diego, has the job of preparing for the Air Force detailed plans for production of a multi-engine supersonic jet bomber, informally called the Hustler.

While the Air Force request for plans does not constitute a pro-

STEEL: Output Totals Stay High

As Reported to the American Iron and Steel Institute

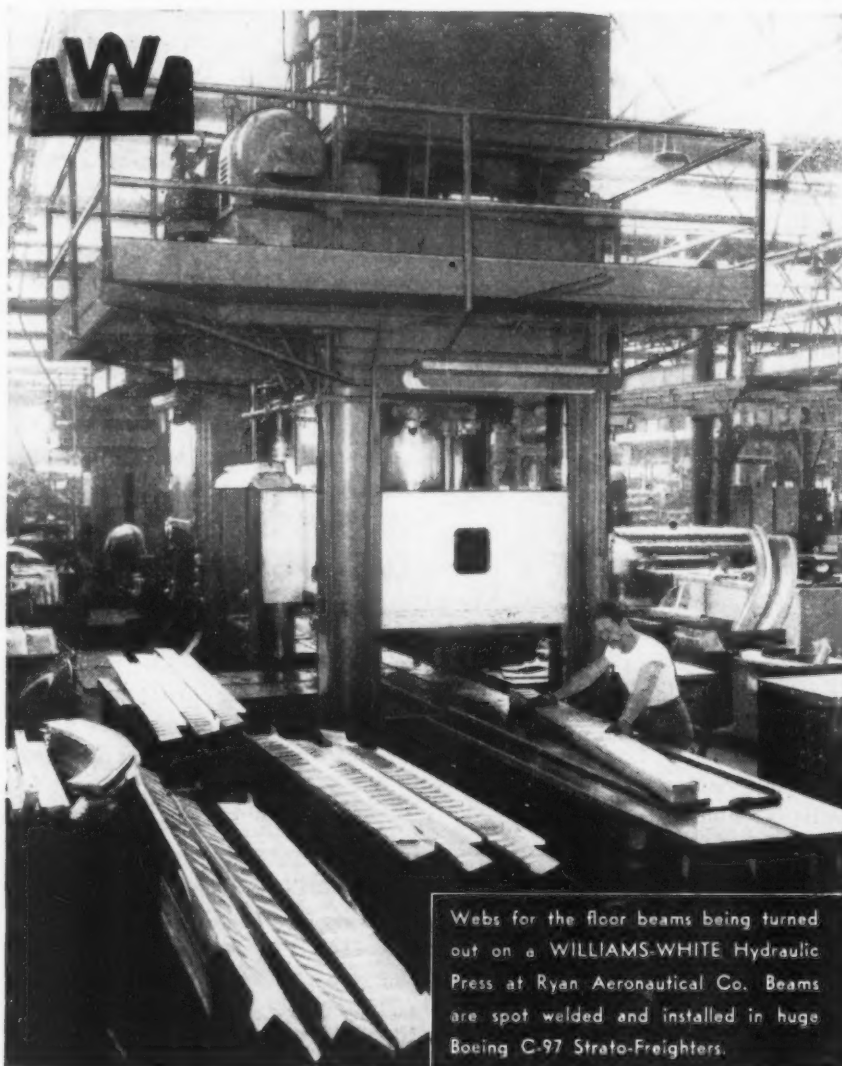
	Openhearth		Bessemer		Electric		Total		No. Calculated Net Tons Weekly	No. Weeks in Month
	Net Tons	Pct Cap.	Net Tons	Pct Cap.	Net Tons	Pct Cap.	Net Tons	Pct Cap.		
1951										
January	7,846,657	101.4	431,725	90.4	570,064	88.8	8,848,446	99.9	1,997,366	4.43
February	6,936,993	99.3	326,112	75.6	507,302	87.5	7,770,407	87.2	1,942,602	4.40
March	8,061,346	104.2	408,926	85.0	606,359	94.5	9,076,630	102.5	2,048,981	4.43
1st Quarter	22,844,996	101.7	1,168,763	84.2	1,683,744	90.4	25,696,503	100.0	1,995,085	12.96
April	7,858,839	104.9	392,472	84.9	594,668	95.7	8,845,979	103.1	2,062,000	4.43
May	8,072,984	104.4	408,650	85.6	616,811	96.4	9,100,185	102.8	2,084,211	4.43
June	7,659,449	102.4	403,001	87.1	589,896	94.9	8,652,346	101.0	2,019,185	4.29
2nd Quarter	23,601,282	103.9	1,204,123	85.9	1,803,077	95.7	26,608,482	102.3	2,045,233	13.81
1st 6 months	46,446,278	102.8	2,370,886	85.0	3,486,821	93.0	52,303,985	101.1	2,621,801	25.87
July	7,706,078	99.8	411,599	88.4	566,818	88.5	8,684,495	98.3	1,964,818	4.42
August	7,694,985	99.5	436,822	91.5	607,308	94.6	8,739,095	99.7	1,972,700	4.43
September	7,653,801	102.4	404,728	87.7	601,830	97.0	8,660,357	101.2	2,023,448	4.29
3rd Quarter	23,054,844	100.5	1,253,147	88.5	1,775,956	93.4	26,083,947	99.4	1,996,892	13.13
9 months	69,501,122	102.0	3,624,033	86.2	5,262,777	93.1	78,387,932	100.5	2,009,947	39.00
October	8,026,721	103.8	458,128	95.9	635,037	96.9	9,121,886	103.0	2,059,116	4.43
November	7,750,845	103.5	411,954	89.1	636,553	102.4	8,799,352	102.6	2,051,131	4.29
December	7,865,830	102.2	396,831	83.3	608,017	94.9	8,870,678	100.6	2,011,486	4.42
4th Quarter	23,665,396	103.1	1,266,913	89.4	1,879,607	96.7	26,811,916	102.1	2,040,481	13.14
2nd 6 months	46,720,240	101.8	2,520,060	89.0	3,655,563	96.0	52,895,863	100.7	2,013,546	26.27
Total	93,166,518	102.3	4,890,946	87.0	7,142,384	94.5	105,199,848	100.9	2,017,642	82.14
1952										
January	8,103,123	100.7	407,298	89.3	625,696	89.7	9,136,117	99.3	2,062,329	4.43
February	7,703,066	102.4	382,712	89.8	571,432	87.6	8,657,210	100.7	2,001,114	4.14
March	8,401,140	104.4	378,861	83.1	624,190	89.5	9,404,191	102.2	2,122,842	4.43
1st Quarter	24,207,329	102.5	1,168,871	87.4	1,821,318	89.0	27,197,516	100.7	2,092,117	13.00
April	7,101,199	91.1	323,006	73.2	566,937	83.9	7,991,142	89.7	1,862,737	4.29
May	7,291,865	90.6	318,642	69.9	584,089	85.2	8,204,596	89.2	1,852,033	4.43
June	1,446,927	18.6	22,862	5.2	169,702	25.1	1,639,491	18.4	382,166	4.29
2nd Quarter	15,839,991	67.0	664,510	49.6	1,330,728	55.0	17,835,229	66.0	1,370,886	13.01
1st 6 months	40,047,320	84.8	1,833,381	68.5	3,152,046	77.0	45,032,747	83.4	1,731,363	26.01
July	1,347,587	16.8	2,000	0.4	277,371	39.8	1,626,958	17.7	368,090	4.42
August	7,599,888	94.4	309,361	67.8	589,438	84.5	8,498,687	92.4	1,918,440	4.43
September	8,039,128	103.4	351,620	79.8	671,357	99.6	9,062,105	101.9	2,117,314	4.28
3rd Quarter	16,986,603	71.2	662,981	49.1	1,538,166	74.4	19,187,750	70.4	1,461,367	13.13
9 months	57,033,923	80.2	2,496,362	62.0	4,690,212	76.1	64,220,497	79.0	1,640,789	39.14
October	8,747,640	106.7	347,042	76.1	712,148	102.1	9,806,830	106.6	2,213,731	4.43
November	8,402,000	107.8	337,000	76.3	707,000	104.7	9,446,000	106.0	2,202,000	4.29
December										4.42

Note—Percentages of capacity operated in 1951 are calculated on weekly capacities of 1,748,337 net tons openhearth, 107,806 net tons bessemer and 144,891 net tons electric ingots and steel for castings, total 1,999,034 net tons; based on annual capacities as of Jan. 1, 1951, as follows: Openhearth 91,054,020 net tons, bessemer 5,621,000 net tons, electric 7,554,630 net tons, total 104,229,650 net tons. Percentages for 1952 are calculated on weekly capacities of 1,816,637 net tons openhearth, 102,926 net tons bessemer and 157,477 net tons electric ingots and steel for castings, total 2,077,040 net tons; based on annual capacities as of Jan. 1, 1952, as follows: Openhearth 94,973,780 net tons, bessemer 5,381,000 net tons, electric 8,232,890 net tons, total 108,587,670 net tons.

1. Revised.

2. Preliminary figures, subject to revision.

Wings for an Air Freighter on a **WILLIAMS-WHITE PRESS**



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—Manufacturing—

duction contract, it appears to give Convair the inside spot in the race to build an intercontinental heavy bomber that will fly faster than sound. Such a plane, even if produced without the necessity of extensive prototype evaluation, would not be expected as a part of the military air fleet until late in this decade.

Design studies relating to supersonic bombers have been turned in by "other aircraft manufacturers," according to Air Force spokesmen. One of these firms is known to be Boeing Airplane Co., builders of the long-range, Jet-powered B-52.

Current Air Force plans call for building jet bomber strength around the heavy B-52, the medium B-47, and the light B-57. Air Force Under-Secretary R. L. Gilpatric said recently 350 B-47s had been delivered, but volume production of the other two planes is just beginning.

Tin Outlook for 1953 Optimistic

It now looks as if tin can manufacturers will be able to get all the tin and steel mill products they will need from here on in.

Furthermore, National Production Authority is planning to lift shortly all restrictions on the end uses of cans and perhaps allow use of 0.25 lb tinplate wherever blackplate is specified in M-25.

Allocations of tin mill products for can manufacturers will amount to more than 1 million tons for first quarter 1953. This represents a boost of nearly 200,000 tons above third quarter.

Outlook currently is that can manufacturers will be able to get all they want and more during the second quarter. In addition to increasing production, there has been a dropping off of exports of tin mill products.

With respect to the change in M-25, the industry has apparently convinced NPA that the effect of substituting tinplate for blackplate would erase technical difficulties without materially affecting tin consumption. It would take 350 tons of tin to change.

FREIGHT CARS: Output Off the Track

Railroads press once more for 10,000-car goal . . . But steel continues to derail deliveries . . . Bottleneck's in plates, structurals, channels . . . Shortage is acute—By K. M. Bennett.

Ever hopeful, the railroads have renewed their request for construction of 10,000 new freight cars per month during 1953. Their goal: a 1,850,000 freight car fleet at the end of 1954.

Railroads had asked for 10,000 cars per month in '51. But they were disillusioned when deliveries fell below that rate in October 1951, and stayed below it all through '52. The prospect for '53 is equally sour.

The limiting factor on production was and is steel. Specifically, the pinch is in structurals, plates, and channels. Purchasing agents find themselves sought by sellers of relatively plentiful items such as wheels, axles, and castings. But this is no incentive to builders who must also purchase equivalent amounts of structurals for sills and car frames. Tightest part of the bottleneck is in Z's and heavy channels.

On Tickets Alone?—The DTA and NPA have made allocations tickets available. But a ticket constitutes no more than a hunting license in an already crowded preserve.

A steel purchaser for one car builder reports that "I've been able to get tickets for capacity production at our plant. But the structural mills are loaded. I've known those boys (steel salesmen) for 30 years. But they can't do any more than give me a percentage of the steel I need." One buyer reported he was getting 20 pct of his orders filled by a mill, another gave an even lower percentage.

Below Capacity—The shortage is both acute and stifling. A car building firm reports that besides losing almost 1 month's production during the steel strike its

Deliveries of New Freight Cars

	DELIVERIES	RETIRED
1951		
Nov.	9,185	5,453
Dec.	7,545	7,191
1952		
Jan.	6,710	5,336
Feb.	5,971	5,126
Mar.	7,003	5,841
Apr.	6,079	8,535
May	6,277	6,284
June	5,885	5,838
July	4,189	6,348
Aug.	3,421	7,546
Sept.	3,034	6,164
Oct.	4,470	7,007
Nov.	5,929	....

Does not include refrigerator cars, or cars repaired, reclassified, or transferred.

plants are working at 60 to 70 pct of capacity. Industry statistics indicate this situation was widespread during 1952. Restrained by the steel strike and their own shrinking inventories, car builders and railroads were able to put only an average 5656 new cars per month on track. (This doesn't include refrigerator cars which averaged 290 per month.) The low-point was 3034 cars in September. In the same period, an average 6316 old cars were retired monthly. Railroads are currently using 135,000 that are scheduled for retirement in 1953 and 1954.

Not Conversion—A purchasing agent for a car builder indicated that he has searched 15 warehouses in his vicinity weekly. Inventories on hard-to-get items may run under 30 days. But lumber and

casting inventories may pile up to 60 days or more. Complicating this need is a strong reluctance on the part of purchasing agents to make use of conversion steel.

Said one stoutly, "We'll cut back production again before we'll use conversion." Work is being turned away in some cases.

The railroads, despite their obvious need for cars, have cut back their orders. First, they know they won't get delivery for months. (One rebuilder, asked to quote on a rebuilding job coming into his office this week, estimated third quarter delivery.) Second, they'd prefer to let builders' order backlogs shrink. The backlog of undelivered new cars has dropped from 120,251 cars in January to 90,708 cars in October.

The carbuilders themselves see little relief in the first quarter, possible improvements in the second. A few optimists, and they are very few, see some help as early as March. On the third quarter, not even guesses.

Ohio Coal Pipeline Studied

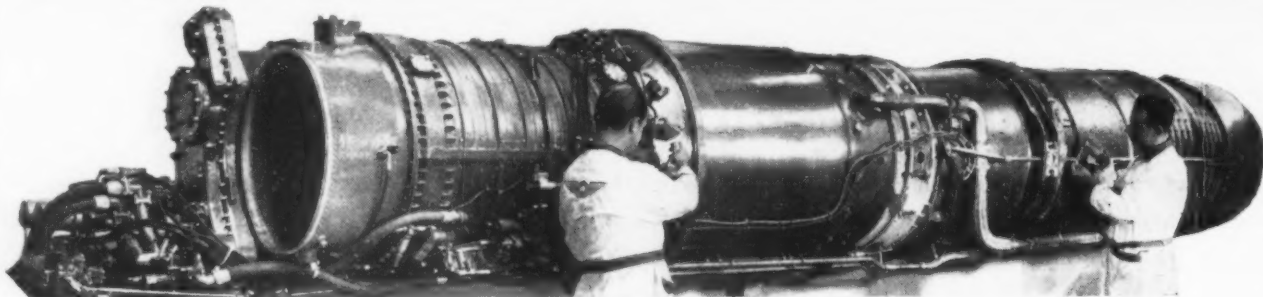
Feasibility of a coal pipeline to run 35 miles from the Ohio River at East Liverpool to Youngstown, Ohio, is being studied by a newly-formed corporation which has the backing of steel producers in the Youngstown area.

Hydrocoal Transportation Co. was organized by Mahoning Valley Industrial Council with Kenneth M. Lloyd, executive secretary of the council, as president.

The proposed pipeline would cost between \$6 and \$7 million. It is estimated Youngstown steel producers might save from 50¢ to \$1 per ton in transportation costs over the present Ohio River to Youngstown rail coal rate of \$1.50 a ton. Approximately 10 million tons of coal are used annually in Youngstown, although only 2 to 5 million tons would be moved by pipe.

Without water transportation, Youngstown steel producers have been at a competitive disadvantage in assembling raw materials. It costs Youngstown mills \$4 to \$5 per ton more than producers located more favorably.





Stainless Jet Parts Centrifugally Cast

Production of jet engine parts is speeded and their performances improved by centrifugal casting of stainless steel.

The cast stainless parts are used mainly around the combustion chamber and exhaust housing, where temperatures reach their highest. Lebanon Steel Foundry, Lebanon, Pa., is

making the castings under license from Firth-Vickers, Ltd., Sheffield, England.

Lebanon claims the process yields higher quality castings with better density, lower rejection rate, and absence of flow lines.

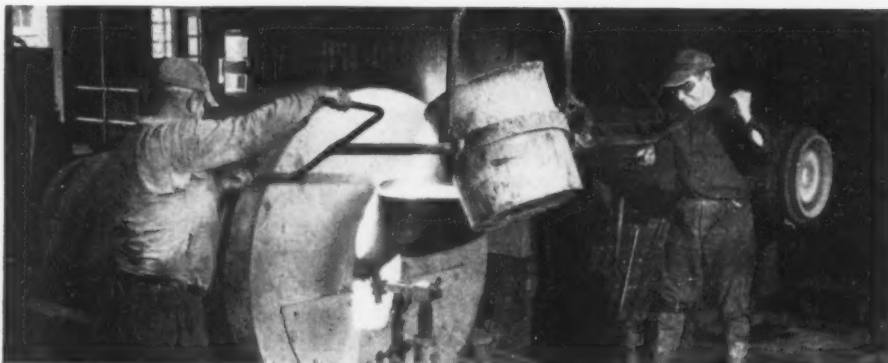
Not only is cast stainless about 30 pct more machinable than equivalent grades of wrought,

forged or seamless tube materials, but Lebanon claims a substantial decrease in machining.

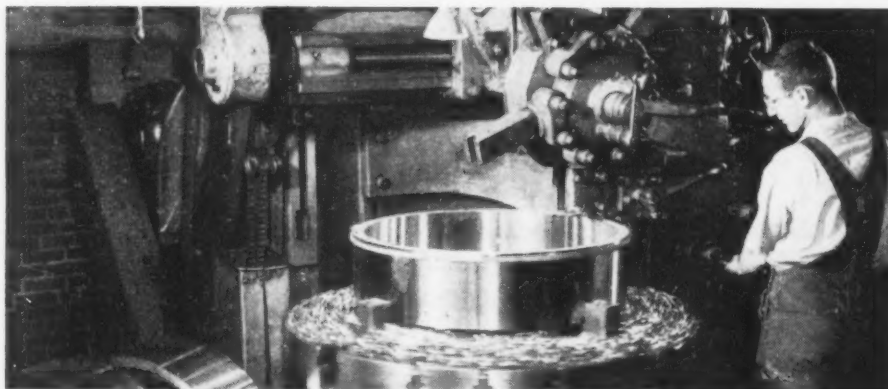
In addition, centrifugal casting permits production of complex shapes which cannot be satisfactorily cast by static methods.



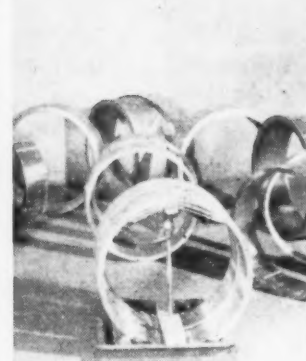
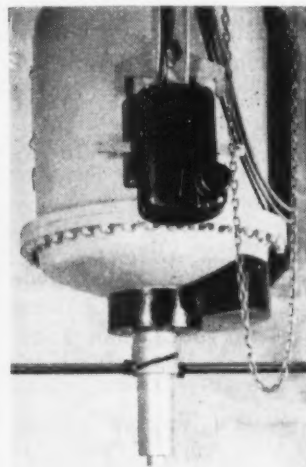
Stainless steel heat is poured for production of centrifugally cast jet engine parts.



In the next step, the molten steel is poured into the centrifugal mold for spinning.



Prior to shipment, the finished jet engine casting is given a preliminary machining.



To make certain there are no flaws, the jet engine component castings undergo a 1 million v x-ray examination.

CASTINGS: The Melt Could Be Heavier

Foundry industry pushes for orders to beat slump . . . Steel castings move well but gray iron and malleable could be better . . . Some recent demand gains recorded—By R. M. Lorz.

Foundrymen are out searching for orders these days. They hope their selling campaign will pull the castings industry out of the slump which has afflicted the market since last July.

Although there has been a slight pickup in November and December, the foundry picture generally isn't bright. Steel castings, closely allied to defense production, are moving fairly well but gray iron and malleable founders say their backlogs are skimpy and demand is off.

What caused the slump? Castings producers blame a tight steel supply, traditional year-end slack, and a falling off of demand.

Some Improvement—Creeping gains recorded in the past few weeks show some improvement in household, electrical appliance and small bench work but sale of heavy castings has fallen off. The drop has been partially caused by decreased consumption by the machine tool industry, until recently an eager market.

Controls and short steel supply have also cut consumption by the automotive industry—a cutback which really hurt because vehicle makers consume from 30 pct to 40 pct of total gray iron production and 60 pct of the malleable output. Demand for farm equipment castings has been following the same downward pattern in most areas since last spring.

Effects of the slow-down throughout the country have been far reaching. Gray iron founders, who produce at least 75 pct of all castings in the U. S., estimate that their total production this year will range from 12 to 12.5 million tons.

Almost 15 Million—Last year the industry topped that with a

figure of 14,987,000 tons. The story is the same in malleable where company officials expect a 15 pct drop from 1,083,000 tons to 920,000

Total U. S. Castings Production

	Gross Tons	
	1951	1952*
Gray Iron	14,987,000	12,000,000 to 12,500,000
Steel	2,050,054	2,000,000
Malleable	1,083,000	920,000

*Estimates by THE IRON AGE.

tons. Producers of steel castings won't be hit quite as hard but expect a drop from 2,050,054 tons last year to slightly under 2 million tons in 1952.

In addition to sales headaches foundry operators are concerned about raw materials costs and inadequate OPS relief through pass-through of higher costs. Within the past year foundry coke has gone up \$1.50 and price of pig iron has jumped \$2.50 per ton.

Office of Price Stabilization has granted the industry less than 1 pct in pass-through relief so far. (Early this week it was learned OPS will allow malleable founders a 6.2 pct increase in prices, effective Dec. 19. This may pave the way for others.)

Semi-Finished Ratio—On the brighter side, some founders qualify depressing production statistics with bullish figures of their own. Gray iron founders, for instance, point out that their industry traditionally has followed expansion of semi-finished steel in a constant ratio of 1 to 5. In per capita consumption that growth was estimated at 195 lb in 1951. Per capita consumption of gray iron castings in 1943 was estimated at only 135 lb.

But foundrymen do not expect to wage their battle for markets

with statistics. Instead they are banking on engineered selling, better quality control, "custom" designing at the drawing board level and better production techniques. Technology and mechanization will also be big factors.

Shell molding and nodular iron are still headliners in the field of technology. A few foundries have succeeded in putting shell moldings on the production line but they aren't publicizing the fact.

Some Drawbacks—Those still "exploring" are enthusiastic but emphasize that shell molding: (1) isn't yet adaptable to steel casting because low melting point is required, (2) may not fit readily into semi-production foundries, (3) is something of a question mark as far as close tolerances and machining are concerned, (4) still requires a special resin which costs 35¢ per lb. (Resin costs are a subject of much concern to some founders who believe shell molding would be more economical than conventional methods if cost could be slashed to around 20¢ per lb.)

According to some foundrymen, nodular iron will also be a doubtful quantity until necessary elements of close control and uniformity are attained. Present heat treating cycle is another stumbling block. Authorities say it must either be eliminated entirely or shortened to make nodular iron more competitive.

Step-Up Mechanization—Complaint that nodular is too similar to malleable and low carbon steel is also heard. And finally, the cost of magnesium and nickel added to patent royalties which accompany use of the process makes nodular an expensive item.

Mechanization, which may result in the "automatic" foundry of the future, is being stepped up by volume producers. Although it isn't a general goal in the industry, there are many small operators using machines to speed up operations and take the drudgery out of foundry work.

ANNOUNCING . . .



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WL introduces "Whelco"—a new tool steel of M grade—a new steel of maximum toughness, hardness and strength—a steel to assure maximum results at low cost! "Whelco" offers great penetration of hardness, great toughness at high hardness, wide hardening range, fine grain structure, and desirable non-deforming characteristics. "Whelco" has good forging properties and is readily machinable in the annealed condition. All WL warehouses stock "Whelco" M tool steel in a wide variety of flats and squares. Call your nearest WL man for a trial order—the results will speak for themselves!

WL steels are metallurgically constant. This guarantees uniformity of chemistry, grain size, hardenability—thus eliminating costly changes in heat treating specifications.

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Fuel

OIL: Storage Tank

**Tank capacity grows . . .
Home goal was 153 million bbl
. . . PAD plans 1954-55 target.**

Oil industry requirements for steel plate to be used in storage tank construction are likely to climb in 1953 as fuel suppliers continue their 18-month program to expand tank capacity by 153 million bbl in the U. S. and 35 million bbl abroad.

This expansion goal in the storage field was the target when the program opened last July 1. A source close to Petroleum Administration for Defense, which announced the current plan and is known to be working on a further goal for 1954-55 operations, says the scheduled growth is "reasonably realistic" and is "related to likely availability of materials."

Just how much steel will be required in fulfilling the Dec. 31, 1953 goal will depend on sizes of tanks being constructed. A general rule-of-thumb method suggested by PAD is to estimate 5 tons of steel per thousand bbl of capacity. On this basis, total need for 188 million bbl would be 940,000 tons.

Increased Capacity—Significant in relation to the drive for expanded tankage facilities is a report published last week by the Committee on Petroleum Storage Capacity, National Petroleum Council, which points out that the industry has substantially increased its capacity to store and handle crude oil and refined products in the past 4 years.

In addition, this study notes, unavailable inventories of oil and refined materials also have increased during the same period. The committee found ample proof of a fact indicated by previous experience—relatively low ratios of actual inventories to total storage capacity in service are needed to prevent difficulties in processing, handling, and distribution.

Half Full—In the 48 months ended last Mar. 31, total capacity for storing crude oil in tanks above ground grew by 12.7 million bbl

to 429.4 million. Total crude oil in tanks, pipe lines, tankers, and other storage facilities on Mar. 31 was 238.4 million bbl. The above-ground tanks were less than half full, containing 192.7 million bbl.

Storage capacity assigned to what the industry calls "clean products" on Mar. 31 was 425.5 million bbl. These facilities were nearly 48 pct full, containing 203.8 million bbl of products. By Dec. 31, capacity for these materials is expected to be about 443.1 million bbl.

All told, there were 220.3 million bbl of clean products in various types of storage last Mar. 31. Unavailable, or locked in the industry's operating system, were 87 million bbl, including 8.2 million bbl required for pipeline fill.

These unavailable quantities must remain in the system to facilitate reaching normal operating levels, according to the report. Residual fuel oil in the unavailable category decreased by 5 million bbl in the 4 years ended Mar. 31, but quantities of clean products rose by nearly 12 million bbl and crude oil by 18 million.

The nation's ocean-going oil tanker fleet will have to be increased by at least 100 vessels above the number available in 1950 in order to handle the increasing production of petroleum, say Washington reports.



AMERICAN CHEMICAL PAINT COMPANY

AMBLER

**PENNA.**

**Subject: HOW GRANDDRAW PHOSPHATE COATING
FACILITATES COLD EXTRUSION OF STEEL**

By phosphate coating steel, prior to cold working it, extrusion, drawing, and other forming operations are greatly improved. In fact, it is the protective zinc phosphate coating that makes for the successful cold deformation of steel.

The tremendous pressures that most forming operations require produce extremely high frictional contact between die and metal. Without a protective coating, excessive galling (welding) of dies, breakage of tools, and unduly short die life will result. The combination of a non-metallic crystalline phosphate coating with an adsorbed lubricating film, possesses a low coefficient of friction while maintaining its stability under extremely high deforming pressures. This combination, therefore, greatly minimizes the aforementioned tool difficulties.

Cold extrusion is now being used advantageously in the manufacture of high production generator frames. This operation is facilitated by careful preparation and proper coating of the frame blank which is made from SAE 1010 open hearth plate steel.

After wheelabrating to remove the scale, the blank is rolled up and then fed automatically through a six stage dip wheel type washing machine which cleans the surface and applies the coating. The frame is then fed into an extrusion press where the wall thickness is increased on one end and reduced 47.5 percent on the other end. This operation produces concentric frames of uniform thickness and correct dimensions.

The Granodraw coating produces the proper surface to receive the lubricant by furnishing an extremely adherent film with the proper crystal size and continuity of coating required to insure maximum adsorption and tenacity by the lubricant. The lubricant, Montgomery DF 1101, is a combination of tittle alkali soaps and resins. It is a powder which when dissolved in water and redeposited on the phosphate coated work piece, produces the necessary surface for subsequent operations. This film is dry and considerably less hygroscopic than similar coatings of the soap type. The concentrations of both the Granodraw and DF 1101 are maintained by simple chemical analysis.

Stage	Operation	Chemical	Time	Temperature
1	Load and unload			
2	Cleaning	Tri-sodium phosphate and soda ash	1 Min.	180° F
3	Water rinse		1 Min.	180° F
4	Zinc phosphate coating	"Granodraw"*	4½ Min.	165° F to 180° F
5	Water rinse		2 Min.	180° F
6	Lubricating	H.A. Montgomery lubricant DF 1101	4½ Min.	190° F

*Trade Mark of the American Chemical Paint Company



RUSSIA: How Its Buying Habits Change

**Trade with Free World continues . . . Pays standard prices . . .
Import pattern shifts twice . . . Russia now wants spare parts
. . . Alloy steel is no longer in the top demand position.**

Russia and satellites continue as an important international trader. The U. S. State Dept. attempt to dam the flow of strategic goods to the Reds has been only partially effective. As importers the Reds have nimbly eluded the ban to maintain war production, importing many of the strategic items they needed from Free World nations.

A director of one of West Germany's largest steel import-export companies told THE IRON AGE that Russia buys what it wants at standard world prices. Other Europeans say that quite a bit of trading with the Reds has merely been driven underground. The era of the dummy purchaser and misdirected shipment has flourished. (THE IRON AGE, May 22, 1952, p. 73).

Buying Habits Shift—The pattern of Russian buying from the West has shifted twice in recent years. Significance of these changes is difficult to estimate. They may mean Russia has filled its demand for certain types of goods or could indicate a change of direction in Red industry.

From 1947 through most of 1950 Russia was an eager buyer of steel and succeeded in getting approximately 2.18 million tons from the West. Most of it was high quality alloy types.

By the end of 1950 there was a shift in Russian imports. Steel was no longer the choicest plum. Interest concentrated on wool, rubber, zirconium ores, pychlor-oxide, magnesium, fluorspar and sulfur. Demand for machinery continued strong.

Pay Premium — At the start of the Korean outbreak Russia had difficulty getting what it wanted and was offering higher than world prices on many items. In January, 1951, Russia was paying \$2.98 per lb for cobalt. THE IRON AGE price



OUT WITH OLD: Judged too weakened by World War II bombs to support heavy traffic, the middle span of the Hohenzollern railway bridge across the Rhine river at Cologne, Germany, is replaced by a new section.

listing at that time was \$2.10 to \$2.17 per lb. To get machine tools, Russia offered 10 pct more than market prices for radial mills and boring machines, 15 to 20 pct more for honing units, and 20 pct more for turret lathes.

By the end of 1951 Russia was no longer paying "bonuses." Imports of machine tools moved slowly through 1950 and most of 1951 because of heavy order backlogs. They picked up quickly near the end of '51. OMNIPOL, a Czech export-import agency in Zurich, Switzerland, estimates the value of Russian machine tool and equipment imports from 1950 through November, 1952, at \$480 million. West German traders place the figure at a slightly higher level. It is almost impossible to check this figure.

Second Shift—The second shift in Russian import policy came late

in the spring of this year. Machinery purchases fell off 65 to 70 pct from their spring peak and, while traffic in special steel continues, activity is moderate. Current Red interest is in industrial diamonds (which come in from West Africa via Tangier), precision instruments and machinery parts.

Of this group, machinery parts have top priority. Demand is heaviest for parts for cranes, machine tool spare parts, particularly for large size gear planers and medium size automatics, and motor parts of any kind, with the accent on aircraft engine parts.

Russia has been highly successful in getting these parts through round-about trade channels. Even the U. S. has been hopefully approached for some parts though without too much success.

Weak Links — There are of course defections in almost all countries. Recently an official of an American export firm was charged with conspiring to ship jet engine parts to Poland through a dummy purchaser in France.

In a recent case in West Germany, a company shipped aircraft engine parts, rolling mill equipment and other machinery made in Belgium to the Russians. Value of the shipments was \$4.7 million and the transactions were completed over a brief 2-month period. The firm has been fined \$2200 and one of the directors was jailed for 5 weeks.

No figures are available on the value of Russia's imports of machinery parts but it is known that trade in these items is flourishing. There seems to be little the U. S. can do to stop it.

Austrian Steel Purchase Okayed

Mutual Security Agency has approved purchase by Austria of \$200,000 worth of blackplate and cold rolled strips and \$100,000 worth of electrical sheets from the United States.

Another authorization last week, provides MSA funds for French purchase of \$1.5 million worth of motor vehicles and parts and \$540,000 worth of tractors.

STEEL: Early Freeing Not Planned

NPA waits for direct order from incoming Administration before planning scrapping of CMP . . . Claims little extra steel . . . Cites bigger allocations—By A. K. Rannells.

National Production Authority's present line of thinking includes no plans for an early scrapping of CMP as recommended by the steel industry—except on an outright Administration order.

This was made clear last week when NPA Administrator Richard McDonald said there would be very little, if any, more steel available for first quarter supplemental allocations.

Meanwhile, the agency was getting ready this week to issue initial second quarter allocations. These were to be based on an estimated production of 23 million tons of finished products during the quarter — about 2.5 million tons more than estimated for the first quarter.

Displacement — However, according to NPA, provisions for cashing fourth quarter tickets for steel during January and February have resulted in "substantial displacement" of first-quarter tonnage.

With no open space on mill books except for March, and not much of that, NPA believes there will be a probable 2-week carry-over of rated orders into the second quarter.

Added to this, second quarter allocations are to be more liberal.

All this makes it abundantly clear in the collective minds of NPA that there won't be enough steel to go around during the second quarter. Therefore, CMP must be continued to spread "available supply in a fair and equitable manner," NPA argues.

Industry Controls This Week

Brass—Revoc., Dir. 1, M-82 abolishes regulation under which distributors of brass mill products were allowed to acquire increased amounts of materials to strengthen inventories in August and September.

Coal—Amend. 1, SR 1, CPR 4 raises ceiling prices on anthracite briquets produced in Pennsylvania.

Controlled Materials—Revoc., Dir. 1, M-89 removes regulation governing distribution of controlled materials to retailers, issued last May to aid the rebuilding of flood-damaged facilities.

Freight Charges—Interp. 2, SR 29, GCPR concerns treatment of separately stated freight charges in determining net invoice cost.

Machinery Resellers—Interp. 22, CPR 30, and Interp. 1, CPR 67 prohibits carry-over or refinancing provisions in any agreement between sellers of machinery and related goods under CPR 30 or CPR 67 which call for subsequent revision of prices in excess of the ceiling price in effect at the time of the sale.

Packaging—Amend. 4, Rev. 1, GOR 2, in addition to removing price controls from sales of helium-bearing gas to the U. S., authorizes addition of special packaging, marking and handling expenses to ceiling prices of

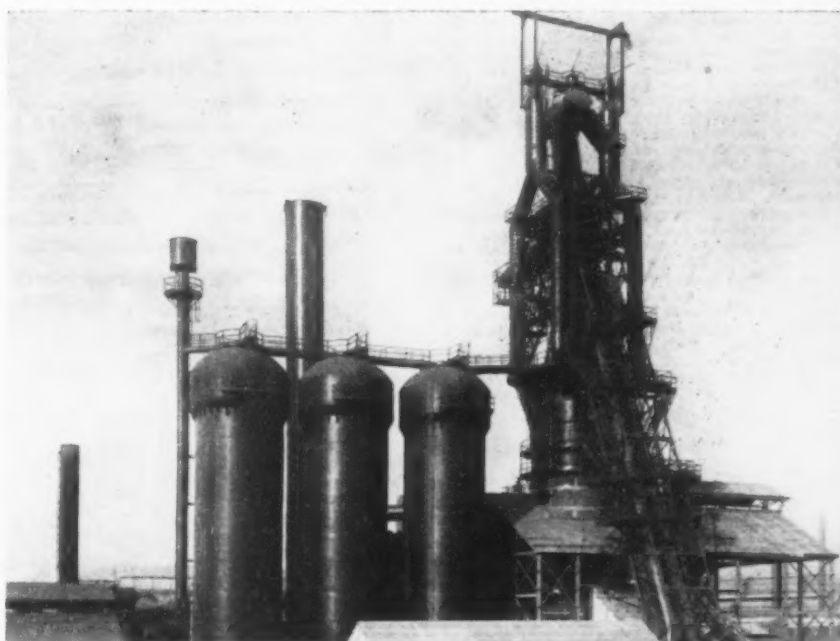
articles sold for overseas shipment by the government.

Defense Goods—Amend. 1, GOR 29 limits special ceiling price adjustments provided for in Sect. 3 (b) (2), GOR 29 to commodities or services sold to fulfill defense contracts. It also states that certification may be obtained only from the defense agency responsible for procurement of the commodity for which a price adjustment is requested.

Pricing—Interp. 35 CPR 22 and Interp. 60, GCPR concern ceiling prices of merged and successor corporations and parity pass-throughs to companies acting as both processors and distributors. Interp. 1, SR 29, GCPR states that adjustment of ceiling prices provided in Sect. 4, Sr 29, GCPR does not include inventory items.

Rated Materials—Suppl., Del. 6, NPA delegates authority to Civil Aeronautics Administration to acquire rated materials to repair Wake Island typhoon damage.

Steel—Sched. 4, M-6A prohibits delivery of certain semi-finished steel products by steel distributors except pursuant to authorized controlled materials orders. Amend 3, Rev. 1, SR 100, GCPR defines "extras and deductions" as applied to base prices used by producers of steel mill products in making price adjustments.



NEW FURNACE: Crucible Steel Co.'s new 360,000-ton blast furnace at Midland, Pa., is now in operation. Built at a cost of \$12 million, it is a major feature of Crucible's \$40 million expansion program. It joins two sister furnaces at Midland.

Defense Contracts

Production Delayed, Not Cut

Full impact of the government production stretchout of tanks and 2½-ton trucks will not be felt until late in 1953 (see p. 95 for production details). Pentagon spokesmen say this latest rescheduling does not reduce the number of tanks and trucks listed for procurement. It does mean, however, that delivery dates are being delayed, and that space on production lines is being created for output of newer types of equipment.

One aim of the program is to prevent obsolete equipment from being stockpiled. It also fits in with the defense planners' view that existing production facilities should be kept in operation so that they will be ready for rapid output in event of an all-out war.

Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation No. or proposal and opening date. (Invitations for Bid numbers are followed by "B," requests for proposals or quotations by "Q.")

Ordnance Tank Automotive Center, Detroit.
Carrier & arm assy, 400, 53-640-B, Jan. 2.
Pawl recoil spade winch, 100, 53-640-B, Jan. 2.
Yoke winch clutch shift ZR, 200, 53-640-B, Jan. 2.
Dog towing pintel, 300, 53-640-B, Jan. 2.
Dog aut towing pintel, 600, 53-640-B, Jan. 2.
Body air brake valve, 132, 53-670B, Jan. 12.
Ring brake valve diaph, 1500, 53-670B, Jan. 12.
Valve hand control assy, 700, 53-670B, Jan. 12.
Kit repair air brake, 4500, 53-670B, Jan. 12.
Kit repair front axle, 500, 53-670B, Jan. 12.
Kit repair low air, 1000, 53-670B, Jan. 12.
Cylinder assy hydraulic, 12350, 53-670B, Jan. 12.
Kit repair carb, 5900, 53-726B, Jan. 2.
Kit repair carb, 30000, 53-726B, Jan. 2.
Kit repair carb, 25000, 53-726B, Jan. 2.
Jet main metering, 185, 53-726B, Jan. 2.
Filter engine fuel primer, 1000, 53-726B, Jan. 2.
Cover carburetor bowl, 200, 53-729B, Jan. 2.
Seat engine carburetor, 600, 53-729B, Jan. 2.
Jet main, 1400, 53-729B, Jan. 2.
Shaft engine carb choke valve w/lever assy, 3000, 53-729B, Jan. 2.
Axle flota lever carb, 800, 53-729B, Jan. 2.
Carburetor assy engine, 300, 53-729B, Jan. 2.
Kit carb repair, 2600, 53-729B, Jan. 2.
Spring RR assy, 6000, 53-753B, Jan. 2.
Valve master external, 1500, 53-754B, Jan. 2.
Cleaner & tester spark plug, 870, 53-704B, Jan. 2.
Hub assy track, 300, 53-642B, Jan. 2.
Disk idler wheel w/tire assy, 4500, 53-642B, Jan. 2.
Anchor rev steering brake, 943, 53-779B, Jan. 2.
Bolt eye engine clutch plate, 259, 53-779B, Jan. 2.
Bolt eye engine clutch plate, 2200, 53-779B, Jan. 2.
Shackle spring, 60000, 53-741B, Jan. 2.
Countershaft w/integ gear, 435, 53-697B, Jan. 2.
Tube assy, 100, 53-640B, Jan. 2.

Corps of Engineers, Chicago.
Drain, shower, cast iron, 4366 ea, A-212, Jan. 2.
Quartermaster Depot, Chicago.
Opener can institutional, 3000 doz, 53-486B, Jan. 7.

Corps of Engineers, Pittsburgh.
Cap, valve, complete, 21393 ea, ENG-36-058-53-120B, Dec. 23.

General Stores Supply Office, Philadelphia.
Clamps water oil and air, 179500 ea, 1-1247B, Dec. 23.

Naval Supply Depot, Mechanicsburg, Pa.
Gages, pressure, compound, 1282 ea, 73-27876, Jan. 7.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Flashlights, tubular, 15400 ea, \$42,254, Fulton Mfg. Corp., Wauseon, Ohio.
Dish trucks, 240, \$27,452, Market Forge Co., Everett, Mass.
Refrigerators, 48, \$80,472, Grand Rapids Cabinet Co., Grand Rapids.
Generator sets, 319, \$146,799, Equipment Co., Berkeley, Calif.
Valve, fuel selector, 330 ea, \$55,341, Hydro-Aire, Inc., Burbank, Calif.
Maintenance parts, car, \$130,392, Douglas Aircraft Co., El Segundo, Calif., W. H. Hough.
Ignition spare parts, var, \$205,629, Bendix Aviation Corp., Sidney, N. Y.
Stack assy's, var, \$281,060, Solar Aircraft Corp., San Diego, Calif.
Maintenance parts, var, \$67,793, Bendix Aviation Corp., South Bend, Ind., G. I. Lyman.
Piston and shaft, var, \$59,913, Hydro-Aire, Inc., Burbank, Calif.
Ducts, boot and sleeves, var, \$26,462, Arrowhead Rubber Co., Downey, Calif.
Spark plug, 5100 ea, \$65,739, Champion Spark Plug Co., Toledo.
Ignitor plug assy, 5488 ea, \$47,197, The B. G. Corp., New York.
Var assys, var, \$31,138, Simmonds Aerocores, Inc., Tarrytown, N. Y.
Valve assy, oil, var, \$26,111, United Aircraft Products, Inc., Dayton.
Valve, hydraulic, 120 ea, \$29,773, Air Associates, Inc., Teterboro, N. J.
Valve assy, 445 ea, \$109,599, Wm. R. Whittaker Co., Los Angeles.
Actuator assy, var, \$142,148, General Motors Corp., Dayton, W. E. Kreitzer.
Hider flash M3, 55000, \$53,669, Teknomatic Machinery Co., New Haven, Conn.
Repair parts for diesel engines, 11940, \$180,670, General Motors Corp., Cleveland, A. O. Cash.
Repair parts for diesel engines, 72358, \$128,716, Cummins Engine Co., Columbus, Ind.



"So there's a little water in the cellar. Think of the ice skating in the winter."

Repair parts for reduction gear, 328, \$25,073, Farrel - Birmingham Co., Inc., Ansonia, Conn.
Repair parts for oil purifiers, 17539, \$93,618, Commercial Engineering Co., Washington.
Repair parts for starting motors, 722, \$26,035, The Leece-Neville Co., Cleveland.
Repair parts for steam turbines, 1119, \$79,306, Dravo Corp., Philadelphia.
Repair parts for turbines & reduction gears, 3841, \$99,218, Westinghouse Electric Corp., Philadelphia.
Valves & repair parts, 1883, \$25,049, Alco Valve Co., St. Louis.
Clutch repair parts for Marine Engines, 1109, \$53,804, General Motors Corp., Cleveland, A. O. Cash.
Repair parts for diesel engines, 58882, \$266,558, Fairbanks, Morse & Co., New York.
Spare parts, var, \$26,748, Power Brake Service, Cleveland.
Spare parts, var, \$37,116, Quickway Truck & Shovel Co., Denver.
Spare parts, var, \$69,547, Bendix Aviation Corp., Sidney, N. Y.
Trap and spacer assy, 1372000, \$392,352, Wald Industries, Inc., Huntingdon, Pa.
Cartridge, ignition, 2600000, \$158,600, Federal Laboratories, Inc., Pittsburgh.
Shot, HVAP-T, M93A1, 10000, \$754,240, Firth Sterling, Inc., Pittsburgh.
Replenishment of hardware, 4935000, \$28,202, Michigan Bolt & Nut Co., Inc., Detroit.
Replenishment of motor vehicle parts, 156, \$61,019, White Motor Co., Cleveland.
Replenishment of hardware, 644000, \$54,303, The Crescent Co., Pawtucket, R. I.
Replenishment of tools, 331, \$31,742, Allen Electric Co., Kalamazoo, Michigan.
Replenishment of tanks and other vehicle parts, 2050, \$47,499, Bendix Aviation Corp., Teterboro, N. J.
Replenishment of small arms parts, 3050, \$253,150, Nevins Mfg. Co., Detroit.
Replenishment of tanks and combat vehicle parts, 2300, \$81,420, Bendix Aviation Corp., Sidney, N. Y.
Replenishment of small arms parts, 1700, \$888,760, Atlas Pacific Engineering Co., Emeryville, Calif.

Construction

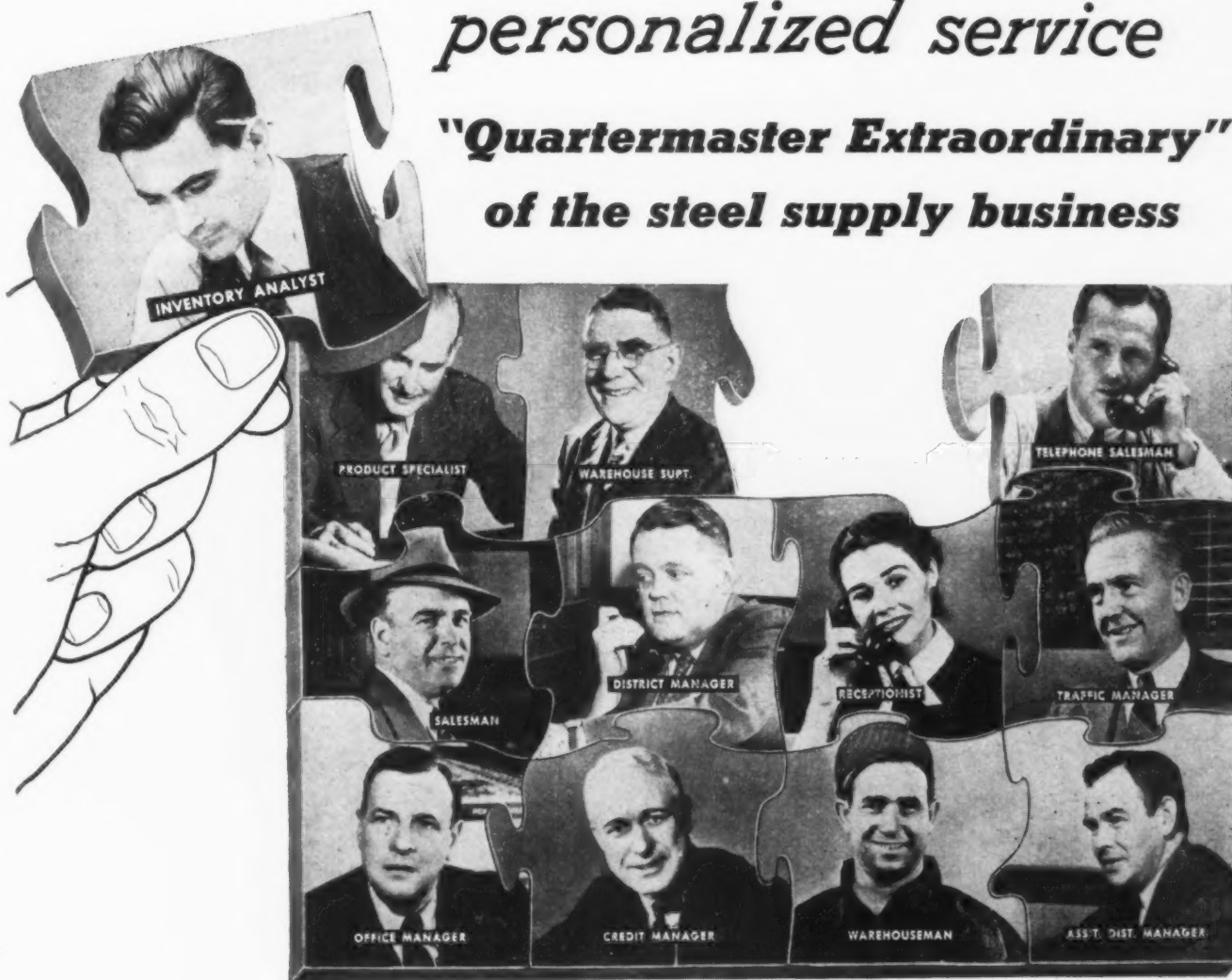
Steel Inquiries and Awards

Structural steel awards this week:
370 Tons, Philadelphia Building No. 55, Frankford Arsenal, to Gantley & Co., same city.
208 Tons, Gray, Tenn., continuous beam span for TVA reservoir, to American Bridge Div. of U. S. Steel, Birmingham.
150 Tons, Bristol, Pa., extension to building No. 34, Rohm & Hass Co., to Max Corchin & Sons, Phila.
145 Tons, Lewistown, Pa., fireman's training school, to Goetz Welding Co.
100 Tons, Philadelphia, Acme Supermarket, to Bethlehem Fabricators, Bethlehem.
Structural steel inquiries this week:
3700 Tons, Wrightstown, N. J., hangar for U. S. Air Force at McGuire Air Force base, bids due Jan. 7.
1540 Tons, Allegheny County, Pa., two new bridges and repairs to existing bridges, LR 764 and others, Pennsylvania State Dept. of Highways, bids due Dec. 30.
560 Tons, Fall River, construction of single story, steel frame building, approaches and utilities at state pier. Completion date Dec. 31, 1953. This is an interstate waterways project.
Reinforcing bar awards this week:
673 Tons, Gloucester County, N. J., New Jersey State Highway Commission, Route 44, Sect. 15 A and 16 A. Johnson, Drake and Piper, New York, low bidder.
315 Tons, Chambersburg, Pa., general purpose warehouse for Letterkenny Arsenal, Hughes-Foulkrod Co., Phila.
215 Tons, Philadelphia, Market St. subway extension at 22nd St. Kaufman Construction Co., same city, low bidder.
178 Tons, Philadelphia, Queen Lane pumping station, city of Philadelphia. Conduit & Foundation Corp., same city, low bidder.

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THE principal job of each Inventory Analyst is to keep his warehouse well stocked so that your orders can always be filled in the shortest possible time. His specialized knowledge of steel sources, mill schedules and the stocks of all our 14 warehouses is of particular value to you when you want to locate special types of steel, an item not ordinarily stocked, or steel that may be in short supply. He is, in effect, your purchasing agent for steel. Efficient buying, based on his knowledge of

your requirements, helps us maintain a schedule of reasonable prices.

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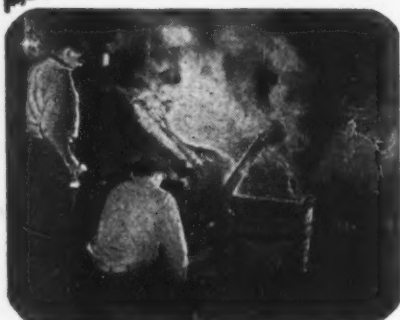
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**a Full-Color
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**STEEL
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THOUSAND
QUALITIES**



Scientific schools and groups of designers, engineers, metallurgists and technical societies can now secure the free use of this full-color sound film, the first produced in the steel foundry industry. Available in 16 mm prints, the film is a 37-minute tour of the modern plant of Lebanon Steel Foundry. The camera follows jobs from the blueprints on the project engineer's desk through steps of production to show, finally, a few of the many important uses of Lebanon quality Steel Castings. Write for information on this exciting and educational film.

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ALLOY AND STEEL
castings



Industrial Briefs

Eastern Rep.—SLOSS-SHEFFIELD STEEL & IRON DIV., Birmingham, has appointed F. W. Marshall & Co. its eastern representative for the sale of pig iron.

Strip Rolling Mill—A 4-high, single stand cold aluminum strip rolling mill is being built by Loewy Rolling Mill Div. of HYDROPRESS, INC., for Wisco Aluminum Corp. of Detroit.

New Name—National Fireproofing Corp., Pittsburgh, has changed its name to NATCO CORP.

Highway Bridge—A contract has been awarded by the State Road Commission of West Virginia to The Contracting Div., DRAVO CORP., Pittsburgh for the first construction phase of a new highway bridge over the Kanawha River at Montgomery, West Va.

Increases Capacity—Vancouver (Wash.) Fabricating Works of ALUMINUM CO. OF AMERICA will increase its cable producing capacity. Construction will start in January.

New Officers—The GREATER DETROIT SCRAP TRADE ASSN., has elected the following new officers for 1953: Sam Schwartzberg, president; Daniel Haron, first vice-president; and Henry Miller, second vice-president.

Moved—SUNDBERG-FERAR has moved into new quarters at 1204 South Woodward Ave., Royal Oak, Mich.

Elected President—Simon Edinburg, district manager of Luria Steel & Trading Corp., Boston, was elected president of the Northern New England Chapter of the INSTITUTE OF SCRAP IRON & STEEL for 1952-53.

Building Plans—LEHIGH UNIVERSITY, Bethlehem, has plans for the building to house what they claim to be the world's largest vertical universal testing machine. Total cost of the new equipment and building is estimated at \$1,200,000.

Dedicated—The Cosmotron, the world's most powerful accelerator of nuclear particles, was officially dedicated recently in special ceremonies at BROOKHAVEN NATIONAL LABORATORY, Upton, N. Y.

Steel Warehouse—LURIA ENGINEERING CO., Bethlehem and New York City, is erecting a 24,000-sq-ft standardized steel warehouse for D. Loveman & Son Export Corp. of Cleveland. It's going up in Cuyahoga County, Ohio.

New Location—The Cutter Salvage Corp., Cleveland, has completed a new plant for its affiliated company at 1061 Lakeland Blvd., Euclid, Ohio. The affiliate company was formed this spring and is known as Cleveland Broach Co., Inc.

Appointment—COLONIAL ALLOYS CO., Philadelphia, has appointed Philton Co. of Wilmington, Del., to represent them throughout the world in the sale of its products and the granting of licenses to use the company's processes.

Consolidated—THE JEFFREY MFG. CO., Columbus, Ohio, has consolidated two of its sales divisions, Coal Preparation and Ore Beneficiation into a new one to be called Materials Beneficiation with William H. Newton, as manager of sales.

Building Project—CAREW STEEL PRODUCTS CORP., of York, Pa., has a \$300,000 building project to be completed by Apr. 30, 1953.

Expands Services—ATLAS PORTABLE MACHINE SALES CORP., Hazel Park, Mich., has expanded its services to include installation, repair, supervision and consultation on forging equipment.

Still Expanding—THE PERMUTIT CO., New York, has placed contracts for further extensions and improvements, including a new laboratory and pilot plant building.

New Firm Organized—BASCO MFG. CO., Stamford, Conn., has been formed. It will make the Basco sheet steel separators.

Completion—A major plant expansion program has been completed by BLOOM ENGINEERING CO., Pittsburgh.

Elected—Harry C. Davis, general manager, Kanawha Mfg. Co., Charleston, West Va., has been elected president of the CONVEYOR EQUIPMENT MANUFACTURERS ASSN., Washington.

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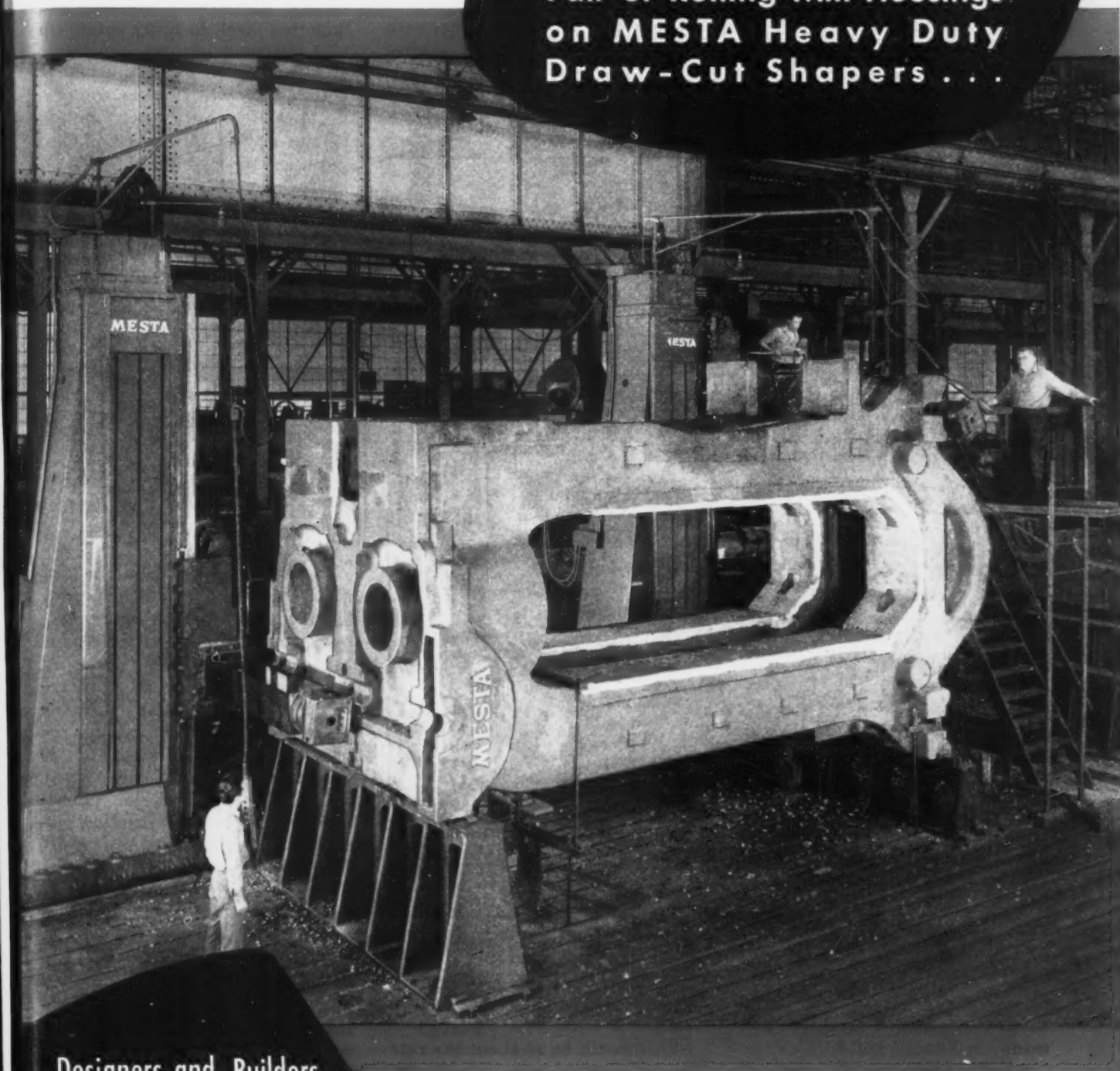
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AGE

MACHINE SHOPS at **MESTA**

DRAW-CUT SHAPERS . . .

Simultaneously Machining a
Pair of Rolling Mill Housings
on MESTA Heavy Duty
Draw-Cut Shapers . . .



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of Complete
Steel Plants

MESTA MACHINE COMPANY
Pittsburgh, Pa.

The Automotive Assembly Line

Automakers May, But Can They?

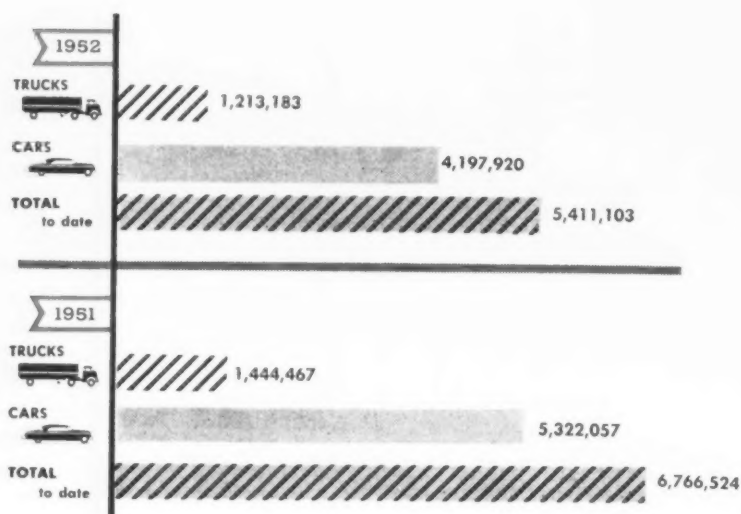
Allowed to build 1.25 million cars in first quarter, 1.5 million in second . . . But steel quotas are for fewer units . . . Copper adequate, aluminum ominous—By R. D. Raddant.

Looking into 1953, automakers have reason to ponder an old grammar fundamental, the difference in meaning between "can" and "may."

in a short time. Steel has not been doled out for the second quarter as yet but NPA predicts it will be sufficient for only about 1,250,000 cars.

Automotive Production—11-Month Totals

(U. S. and Canada Combined)



WEEK ENDING	CARS	TRUCKS	TOTAL
Dec. 13, 1952	93,909*	29,802*	123,711*
Dec. 6, 1952	98,505	30,500	129,005
Dec. 15, 1951	88,115	27,512	115,627
Dec. 8, 1951	93,113	23,819	116,932

*Estimated

Source: Ward's Reports

Automakers know they "may" build 1,250,000 cars in the first quarter and 1.5 million in the second. That's what the last National Production Authority edict is. Real question, however, is how many they "can" build.

So far, steel for only 843,000 cars has been allotted by NPA for the first quarter, with probably a supplemental allotment coming up

The "May" — Specifically, National Production Authority said it could permit second quarter production on a basis of 1.5 million passenger cars and 315,000 trucks.

This would be at about the rate which industry sources in Washington told THE IRON AGE earlier that the industry would like to operate during 1953—aiming at a

rate of 6.5 million passenger car units and 1.5 million trucks.

NPA Administrator Richard McDonald added, however, that the industry could count itself lucky if his agency could issue enough CMP tickets for steel and copper, added to conversion and imported steel, to bring output up to 1,250,000 passenger car units.

Dim View—NPA looks for production of more than 2 million tons of additional steel during the second quarter, but still takes a dim view of the overall supply.

Indications are, Mr. McDonald says, that mill books are pretty well filled up for first quarter. This he interprets to mean a carry-over of at least 2 weeks into the second quarter.

As NPA sees it now, there should be enough copper available to match whatever production steel supplies will permit. Officials concede that if price controls die as of Apr. 30, effect on both scrap and refined copper would warrant some relaxation of copper distribution controls.

Power Shortage—Aluminum is something else. This might easily be the controlling factor. Production losses are continuing because of lack of electric power.

These losses currently are estimated at 42,000 tons for the fourth quarter, 60,000 tons for the first quarter, and about 35,000 tons for the second.

Initial second quarter allocations of the three controlled materials were expected to be ready this week.

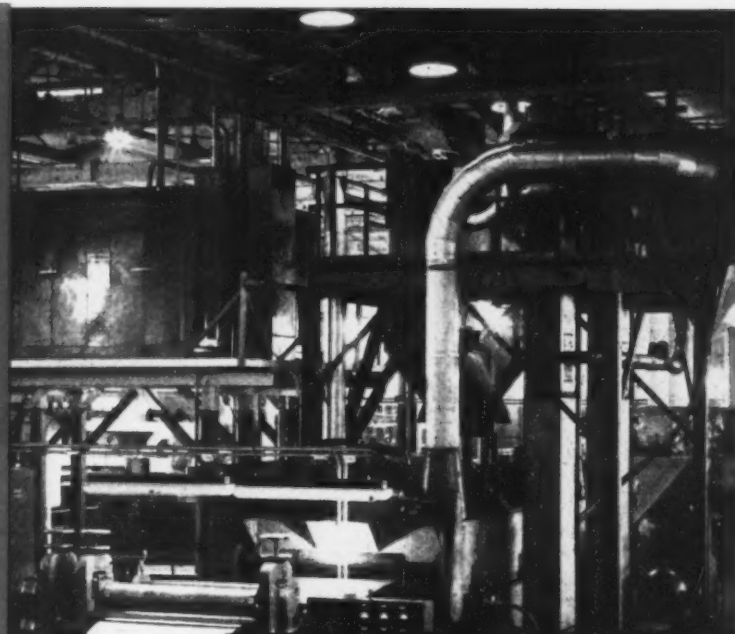
At the same time, NPA dashed hopes that a second supplementary allotment of steel would be available for first quarter output of consumer durables, including automobiles. Mr. McDonald said that NPA wouldn't know how much, if any, would be available for the purpose until late this week.

It is estimated that the auto industry used 350,000 tons of con-

WHEELABRATOR

Mechanical Cleaning

descales
steel strip



... cheaper than pickling

saves valuable floor space

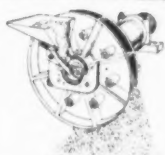
at Rome Cable Corporation

The economics and high speed production of the airless Wheelabrator method of mechanical descaling of hot rolled steel strip are reflected in this typical installation in the Torrance, California, plant of the Rome Cable Corporation, manufacturers of electric weld heavy wall conduit.

The airless Wheelabrator method was selected by Rome Cable Corp. because it was the only process that would economically remove surface scale and permit the rest of the plant to maintain its high production without consuming a major portion of the plant area. Whereas approximately 175 lineal feet of floor space would be required for acid pickling, the Wheelabrator cabinet takes up only 25 lineal feet.

The steel strip is descaled prior to slitting for less than the cost of acid pickling. Another important saving is realized in the fact that the Wheelabrator removes scale only . . . there is no loss of virgin metal.

Wherever steel is processed in large quantities, the possibilities for saving money with a Wheelabrator are tremendous. We would be glad to demonstrate these savings for you. Write today for full details.



WHEELABRATOR — The perfected airless centrifugal blast unit pioneered by American slashes cost and cleaning time. Conserves power, labor, space. Cleaning perfection results in longer tool life, faster machining and grinding, easier inspection.



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WORLD'S LARGEST BUILDERS OF AIRLESS BLAST CLEANING EQUIPMENT



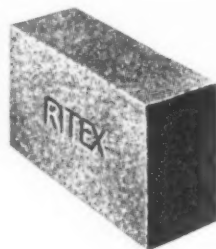
Seasons Greetings
made with brick!

● Those bells that ring out Yule . . . the electric train under the tree . . . the piles and piles of packages—most everything we enjoy at Christmas owes its origin, in part, to *refractory* brick.

● Without refractory brick to line the furnaces of industry there would be no heat, light or power, no paper, no metal, no manufacturing, no transportation.

● Next to agriculture, there is no more vital contribution to the economy of our nation than such heat-resisting refractories products as those made by Grefco. From Grefco mines and plants—here and overseas—General Refractories Company is supplying brick, mortars, plastics and castables to serve our nation in times of peace and in times of problem.

● At this time of year let us hope it will be peace. But whatever problem we must face, let's make sure American men and American industry are ready to measure up!



General
Refractories
Company

PHILADELPHIA

Automotive News

version steel in the fourth quarter alone. One official disclosed that his company is operating on 20 to 25 pct conversion or foreign steel.

Another Problem — One thing that NPA did not consider is employment. A little less than a year ago automotive unemployment resulting from cutbacks without compensating defense orders caused one of the biggest uproars in Washington. If such a thing recurs, the uproar will be louder.

In spite of the steel strike which robbed the industry of so much summer production, 1953 totals will approach NPA quotas. Total permitted production was 4,370,000. By Dec. 31 the industry will have produced about 4,325,000 passenger cars.

Hp Fight—There are some signs of open warfare between advocates of the high compression engine and those who favor raising hp by methods other than increasing octane and boosting compression ratios.

As an ardent exponent of the latter, James C. Zeder, Chrysler vice-president and director of engineering and research, stated his position last week in Tulsa, Okla.

Resistance—It should be noted that Chrysler held out against raising compression while General Motors divisions have boosted compression. This development of the high compression engine has placed no little pressure on the petroleum industry to produce higher octane fuel.

Without mentioning any of his competitors by name, Mr. Zeder pointed out that "quite a bit of educational work has been done to acquaint the public with the virtues of raising engine compression ratio." Conceding the soundness of this approach he questions the demand for higher octane fuel.

"Super power without depending on super fuel means new engine design," he said. "That is what we have done at Chrysler with hemispherical head V-8 engines with opposed overhead valves."

STRETCHOUTS:

Automakers calm on military slowdown, want civilian car workers.

Military stretchouts, this time hitting military trucks and medium tanks, were accepted philosophically by contracting auto companies. In most cases they were glad to grab whatever manpower was turned loose by the slowdowns for their primary interest, auto production.

In fact, Ernest R. Breech, executive vice-president of Ford said he "welcomed" the tank cutbacks as "substantial savings to the taxpayers."

Ford probably suffered as much as any affected company in that the Livonia Tank Plant was built by Ford specifically for the purpose of producing tanks. Now its present program will end by the close of 1953.

How It Looks—Here is the way the stretchout now appears:

Fisher Body will continue production of Patton M-48 tanks at

Grand Branch, Mich., and Chrysler at Newark, Del., but at a slightly reduced rate.

Ford will continue to make the same tank at Livonia. But at a slowing rate which will end the program in the latter part of 1953.

American Locomotive at Schenectady will bring its M-47 production to a close by the end of 1953 and will not go into production of the Patton as planned.

Detroit Tank Arsenal, operated by Chrysler but government-owned, will discontinue M-47 production after it fills production transferred from the American Locomotive contract.

GMC Truck & Coach and Reo Motors will continue 2½-ton military truck production at a reduced rate. Studebaker will discontinue its military truck line at the end of 1953.

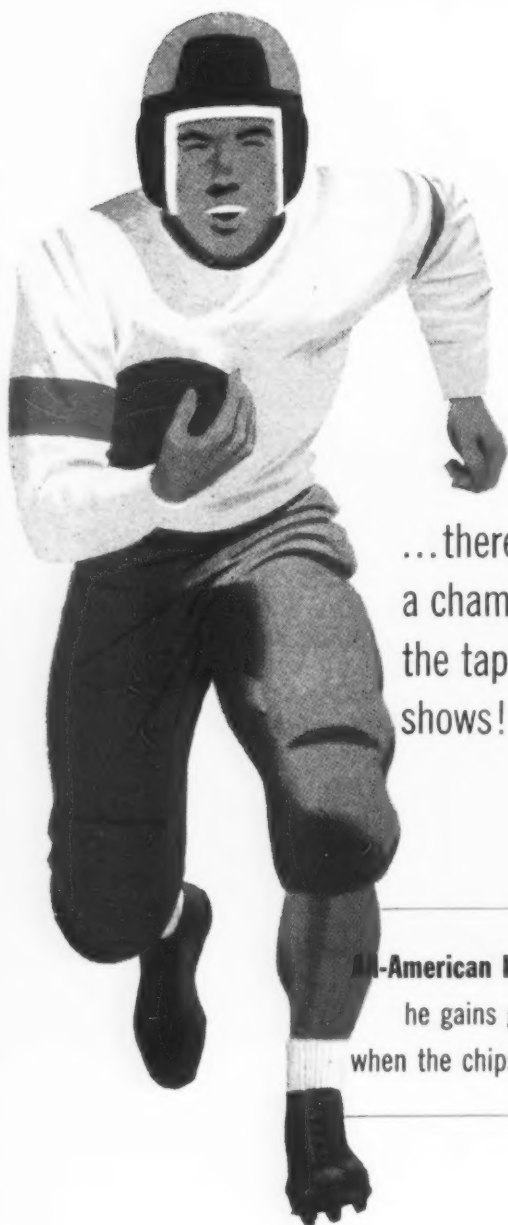
Studebaker indicated that military cutbacks will begin at a time when the manpower can be easily utilized on new model production. Reo and Fisher Body also said layoffs would not be made necessary by the stretchout.

THE BULL OF THE WOODS

By J. R. Williams



IT'S PERFORMANCE THAT COUNTS



...there's more to a champion than the tape measure shows!

All-American Halfback...
he gains ground when the chips are down.



Average Halfback...
he may measure the same... but he's stopped in the tough ones.

HARDTEM DIE BLOCKS* perform like "champions" in your production line!

Heppenstall Hardtem Die Blocks perform like "champions" because they possess those extras that result in superior quality. Their patented steel analysis

resists softening and heat checking in service. Records from plants using Hardtem Die Blocks provide the following benefits for production:

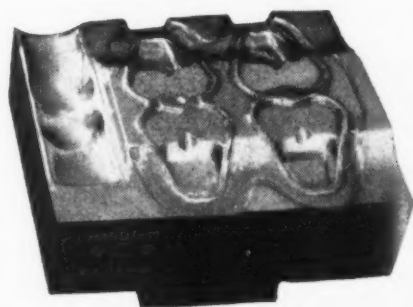
- ★ Longer Production Runs
- ★ Long Life of Dies
- ★ Lower Overall Die Cost
- ★ Less Down Time
- ★ Holding of True Dimensions



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It will pay you to try Hardtem Die Blocks.
Call Heppenstall Company, Pittsburgh 1, Pa.
Sales offices in principal cities.

The most dependable name in die blocks



This Week in Washington

Wage-Price Controls Have Rotten Core

Mr. Truman's wrecking of wage stabilization simultaneously undermines price controls . . . New Administration has no choice but to end them . . . Industry rebels—By G. H. Baker.

The Administration's hastily erected new facade for "wage controls" is proving even a poorer cover-up than before. It is suffering from two major ruptures. The

til an industry panel has been selected. Industry should now take care that their boycotting of WSB is not interpreted by the public as a scheme to wreck controls. In-



DIFFERENT INTERPRETATION: CIO President Walter Reuther (right) last week advised ESA's Roger Putnam wage controls must go out the window. Reason: price controls have been weakened to such an extent wage controls are not justified. Industry maintains it has been the other way around. Case history of the Wage Stabilization Board is convincing evidence.

first came when the original Wage Stabilization Board, stacked by the Administration to favor the unions, allowed over-ceiling pay boosts for steel, aluminum, and copper industries.

After the WSB was reorganized by a disgusted Congress to thwart the bias of the Administration, Mr. Truman overruled its decision and permitted over-ceiling pay hikes to coal miners.

Economic Stabilization Boss Roger Putnam delegated his authority to rule on wage cases to the public members of WSB. Labor members will stand by as advisers but will not actively participate un-

stead, it should be pointed out, industry has withdrawn from a useless shambles of controls machinery—wrecked by Mr. Truman himself. His is the hand that wielded the axe.

Dismal Chapter — Unless the President can come up with something more impressive than his present high-handed method of deciding wage cases if WSB decisions go against the grain of his political maneuvering, he has not only demolished wage controls but price controls as well. You can't have one without the other.

Ostensibly he is trying to pre-

serve wage-price controls so that the new Administration must take the responsibility of ending them. Actually, his destruction of wage-price controls gives the new Administration no other alternative but to put the period mark on a chapter that ended dismally.

Industry Rebels—Indicative of the contempt now held for Mr. Truman's "stabilization program" today is the point-blank refusal of two leading industry groups in Washington—the Chamber of Commerce of the U. S. and the National Assn. of Manufacturers—to recommend any more candidates for WSB positions.

Importance of this refusal lies in the fact that these industry groups traditionally have supplied the White House with names of available industry leaders to fill vacancies on government boards and commissions. Refusal to participate further in what the two groups termed a "sham" and a "waste of time" is the first such case on record in Washington.

We Need Tankers—Government aid in construction of speedy, ocean-going tankers is to be asked of the new Congress.

Stepped-up demands of U. S. military forces around the world for petroleum products have all but rendered World War II-type tankers obsolete. Today, more than ever before, the accent is on speed.

Program to be outlined to Congress early next year will emphasize need for construction of 20-knot tankers. Few merchant ships in operation today—except those of the new *Mariner* Class—are capable of making such speed.

No Reserve Fleet—Government maritime officials are today aware—just as the oil industry is—that the U. S. is dangerously close to being a "have-not" nation when its tanker fleet capacity is weighed against total demand.

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Mr. Tubes—your nearby B&W Tube Representative—will be happy to provide additional information and to discuss any specific tubing problem with you.

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published in ready-reference form as fast as data can be reviewed and verified.

B&W offers a most comprehensive file of information on stainless tubing, both seamless and welded. The technical help this literature offers is exceeded only by the personal assistance on specific tubing problems you may expect from B&W field representatives.

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YOURS FOR THE ASKING

- | | | | |
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| TB-11 | Specifications for Seamless and Welded Tubular Products—Stainless, Alloy and Carbon Steels | TDC-140 | B & W Stainless Pipe and Tubing — Croloy 12 Al (Type 405), Croloy 18 (Type 430), Croloy 27 (Type 446) for Pressure and Mechanical Uses |
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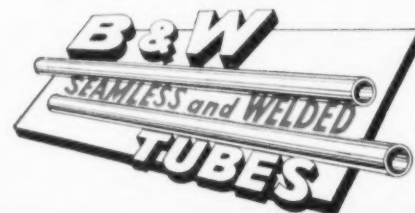
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BUILDING: Controls Easing Speeded

Relaxation of construction materials curbs moved up from May 1 to Jan. 1 . . . Aluminum not affected . . . Recreation projects get self-certification . . . Steel, copper limits raised.

Modification of construction regulations with respect to controlled materials, previously scheduled for May 1, now has been slated to go into effect as of Jan. 1.

In general, the revision consists of a broadening of self-certification authority for steel and copper building materials. The relaxed rules will not apply to aluminum until May 1.

Also, for the first time since 1950, recreational and amusement type projects will be removed from the prohibited list and share in self-certification authority.

National Production Authority estimates that this means that up to 30 pct of building projects will not have to have CMP tickets for their supplies of steel and copper.

Who Gets What—Under amended Dir. 8 to CMP Reg. 6, self-authorization will be permitted for steel and copper as follows:

Recreational, entertainment, and amusement: Up to 5 tons of steel per project per quarter, including up to 2 tons of structurals; 500 lb of copper and 300 lb of aluminum. Previously, no self-certification was allowed.

Highways: No increase in the 25 tons of steel and 500 lb each of copper and aluminum previously allowed per project per quarter. But highway contractors can get 12 tons of structurals instead of 2 tons.

Housing, 1-to-4 units: Stays at 1950 lb to 2300 lb carbon steel, 200 to 275 lb of aluminum, and 200 to 400 lb copper. Change is permission to self-certify up to 1500 lb of structurals in addition to materials now permitted.

Multi-unit housing, walk-ups: Are permitted 2 tons carbon steel, including 500 lb structurals, 200 lb copper, and 275 lb aluminum,

per project per quarter. No self-certification previously.

Multi-units, elevator type: Previously barred from self-certification, these may now get 3 tons carbon steel, including 600 lb structurals, 225 lb copper, and 275



POINTERS: Secretary of Labor Maurice Tobin (right) gives incoming Secretary Martin P. Durkin, CIO steamfitters union head, a few pointers on his new job.

lb aluminum per project per quarter.

All Other—The categories of industrial and all other, which includes commercial types such as stores, municipal and institutional construction, have been lumped together under the "all other" category. Self-certification allowances per project per quarter are:

Up to 25 tons of carbon steel, including up to 2½ tons alloy but no structurals, 2.5 tons copper and 2 tons aluminum. Chemical plants will be an exception and be authorized to order 1 ton of stainless per quarter.

Merging of categories under the "all other" grouping automatically raises the dollar ceilings per-

mitted for equipment and machinery for many classifications. All types under this heading can get up to \$100,000 worth of building equipment and up to \$200,000 in production equipment.

It is believed by NPA that as much as 90 pct of the materials bought under the relaxed order will probably come from warehouse stocks.

TAXES:

Even the Democrats scramble aboard the Republican tax cut bandwagon.

Capitol reports show Democrats in Congress are scrambling aboard the tax-reduction bandwagon. Two key minority members of the tax-writing House Ways and Means Committee—Reps. John Dingell, of Michigan, and Wilbur D. Mills, of Arkansas, are now on record as supporting tax-cut proposals advanced by Rep. Daniel A. Reed, R., N. Y., who is in line to head up the revenue-raising group in the House.

Tentative plans call for a reduction in personal income taxes of about 5 pct next June 30. Under Mr. Reed's proposal, tax cuts now scheduled to become effective Dec. 31, 1953, will go on the books 6 months earlier.

In addition, the present excess-profits tax, which is scheduled to expire at the end of next year, will be erased from the books on June 30, 1953.

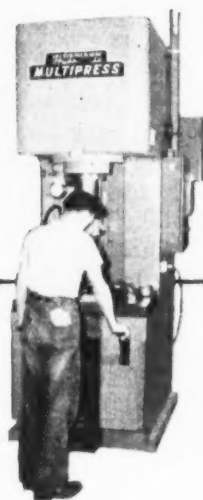
How Much—To the average taxpayer new individual income tax rates will mean a cut of about \$30 for the first year, and about twice that much in 1954.

Under Reed's plan, the present personal income tax rate would be reduced from 22.2 pct to 20 pct on taxable income under \$2000; from 24.6 pct to 22 pct on taxable income between \$2000 and \$4000, and from 29 pct to 26 pct on taxable income between \$4000 and \$6000. Percentage reductions would be smaller in the upper brackets, because the Korean War tax laws did not raise rates as sharply for the top groups.

G-E Report Verifies Advantages of Hydraulic Presses



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MULTIPRESS®
CUTS COSTS
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ASSEMBLY



More proof that the right use of hydraulic pressure cuts staking costs several ways! General Electric's own experience with Multipress, in their Meter and Instrument Division, echoes gains reported by dozens of other users.

With Multipress, ram speeds and pressures are closely adjustable to each different job need, and are *automatically controlled* for continuous accuracy. This eliminates the need for skilled operators.

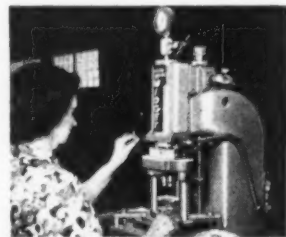
In addition, Multipress does the work *without sudden impact*. Working pressures build up *after* tooling contacts the parts. Among other advantages, this cuts tool wear and ends a major cause of tool damage.

But Multipress assures even bigger gains in reduced scrap losses, because its smooth action lets metals "flow" into place without losing their normal tension characteristics. At G-E, scrap on staking operations had often run from 5 to 25 per cent. Multipress cut these losses to *one per cent or less*.

Ease and safety of operation—plus quietness—are added Multipress features. And most Multipress advantages apply also to many other production jobs—bending, drawing, flaring, stamping, forming, blanking, riveting, and so on.

Write today for full information on Multipress and its many accessories for special needs.

Multipress offers 8 frame sizes. Capacities range from one-ton to the 50-ton unit shown directly above. Model at upper left, equipped with Multipress Index Table, automatically rotates parts under press ram. Note handy storage of parts at center of table dial.



The Multipress "Midget" offers one-ton capacity.

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Alaska Booms Despite Climate

Territory now undergoing greatest construction period in its history . . . Western builders eye jobs . . . Climate poses formidable problems . . . Untapped riches—By T. M. Rohan.

Alaska is now undergoing the greatest construction period in its history and wants California to help it build.

Col. C. L. Foote, Alaska district engineer for the U. S. Army Corps of Engineers at Anchorage, last week told 350 construction contractors in San Francisco how they can get a share of \$240 million contracts for 112 projects in 1953. About \$100 million is carried over from the 1950, 1951 and 1952 programs which totaled \$325 million.

But building in the North is no snap. Col. Foote outlined some of the unusual problems and requirements.

Problems—Most buildings are steam heated by pipe from central plants because of the fire hazard. In temperatures like -65°F in the northern part, water from firemen's hoses would freeze before it hit a burning building.

In the northern part all underground utility pipes must be encased in 7 x 7 ft heated concrete enclosures.

Concrete has been poured at -50° to -60°F . Although uneconomical, it is done on rush jobs.

Deep Freeze—Underground "permafrost," layers of fine earth down to 200 mesh, are permanently frozen and must be either thawed out or blasted. Heat of drilling thaws the frost and clogs the bit. Buildings are anchored in it and elevated off the ground for easier insulation. Thawing is done with vertical steam pipes on 7 to 10 ft centers, 30 to 35 ft down. This sometimes takes weeks or months.

Steam emission from plants must

be controlled because at -42°F it becomes ice fog and has closed airports for 4 or 5 days.

But the best news for contractors was that local finance offices have been set up for speedy payment for work—always a headache on these projects.

Shipping Center—The Puget Sound area has traditionally been the gateway and supply center for Alaska, principally through the Alaska Steamship Co. from Seattle. The Coastwise Shipping Co. of San Francisco, however, started service from Los Angeles north in 1948. Last week it reported 34 pct of Alaska cargo is from California.

"Seward's Folly" is really booming these days. Population is 153,000 (22,000 military) or 77 pct over 1940. In 1951 it produced 400,000 tons of coal, will hit 1 million tons by 1954.

Resources—Alaska has total mineral yield of \$15 million in

1951. There is some local oil production but due to an old law restricting the size of areas which may be leased, big firms cannot profitably go in. The Navy, however, is carrying on promising deep well exploration.

There are 15,000 acres under cultivation and 1000 new businesses started in the last 2 years. Still 90 pct of the food must be imported. There is a \$100 million fishing and canning industry.

U. S. Tin Corp. at Cape Prince of Wales processes 100 tons of vital tin ore, the only tin mine under the U. S. flag. Deposits are believed to be as great as Bolivia's.

But the biggest project is yet to come—the \$550 million Taiya Valley aluminum plant 12 miles from Skagway announced Aug. 23 by Alcoa. About 20,000 people would be employed and total investment could hit \$700 million. (THE IRON AGE, Aug. 28, 1952, p. 45.)

Sandwich—The biggest tuna sandwich in the country is in San Diego. There, a plant stuffed with 500,000 cans of tuna daily is surrounded by a shipyard, structural steel plant, foundry and miscellaneous shops and warehouses on a 23-acre waterfront site.

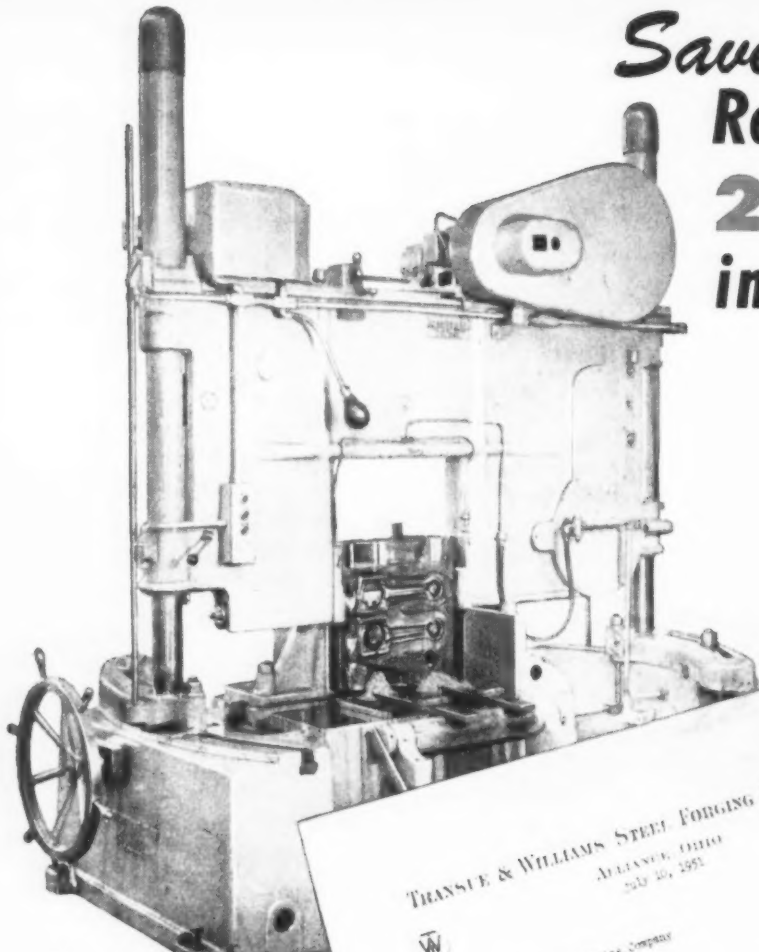
The National Steel and Shipbuilding Corp., with a current \$10-million backlog is the bread, and the filling is the Westgate-Sun Harbor Co., which packs 250 tons a day of Breast-O'-Chicken tuna. And the two have much in common, for among other sea-going craft, National builds steel and wood tuna clippers, which regularly bring in fish for the cannery.

Other shipyard products include shrimp trawlers, oceanographic research vessels, tenders, speed boats and steel barges.

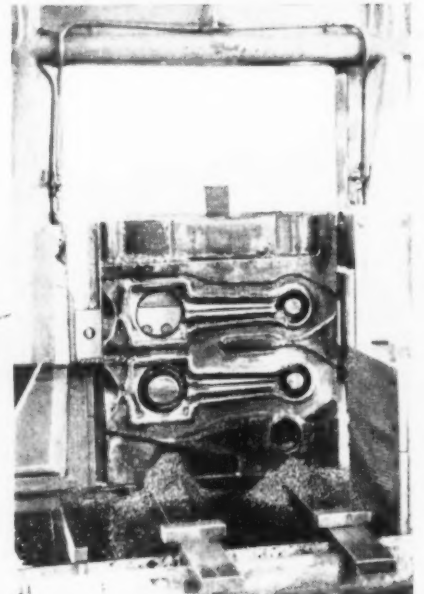
Fabricated steel has been supplied by National for bridges, hangars, industrial plants, parts.

National's foundry produces cupola-melted alloy, brass, aluminum, and dural, and ferrous and nonferrous for a multitude of purposes.





Save 25% Time in Re-facing Dies... 20% Time-plus steel- in Shanking Them



"Our saw has been in operation 2 years. Most of our sawing has been on die blocks..."

"We are removing the worn impression from the face of die blocks for resinking... we recently removed 2 inches from face of blocks measuring 19" x 17"... sawing time 296 minutes for 2 blocks... Set up time 31 minutes... grinding time 155 minutes... total 8 hours and 2 minutes.

"Average time for removing same amount of stock from these die blocks with planer, 10 hours and 15 minutes. Sawing saves approximately 25% of time..."

"With regard to removing excess stock to provide shanks... we remove approximately 90% of metal by sawing after which block is sent to planer for finishing. Time for sawing and planing is 20% less than planing alone.

"Pieces of stock removed by sawing are useful in many ways... saves buying of some trimmer steel."

TRANSUE & WILLIAMS STEEL FORGING CORPORATION
ALLIANCE, OHIO
July 10, 1951



Armstrong Blum Manufacturing Company
7700 W. Bloomingdale Avenue
Chicago 29, Illinois

Attention: Mr. Van Austin,
Sales Manager

We feel that you would be interested in having some of the data we have compiled on our No. 24 Marvel Metal Cutting Saw. As you know, our saw has been in operation approximately two years. Most of our sawing has been on die blocks furnished us either by the Heppner-Hall Company of A. Flint & Sons Company.

We wish to advise you that we are removing the worn impression from the face of the blocks for resinking with the use of this saw and find that it works to a very definite advantage, depending somewhat on the amount of stock to be removed from the face of the die. On a job which we recently removed two inches from the face of blocks measuring 19" x 17", our sawing time was 296 minutes for the two blocks, set-up time was 31 minutes, and the time required for grinding the face after sawing was 155 minutes, total 482 minutes or 8 hours and 2 minutes. To remove the same amount of stock from these blocks with our planer, over an average of eight sets of dies required 10 hours and 15 minutes for planing and grinding, or approximately 145 minutes. We might point out that our labor rate for a saw operator is less than that being paid to a planer operator, which increases the saving somewhat. From our experience, we find there is somewhat less, but in our case has been definitely in favor of the saw.

With regard to removing excess stock to provide shanks on our dies, this naturally varies with the size of blocks and the depth of the shank formed. However, our average over a year and a half period has indicated to us a saving of 20% in other words, we require approximately 90% of the metal by sawing, after which the blocks are sent to the planer for finishing the shanks. The total elapsed time for the sawing and planing we have found to be less than the pieces of stock removed by the severe method. Also like to point out that the pieces of stock removed by the severe method to us in many ways are quite valuable in the resinking of buying time of our trimmer steel.

Perhaps you also would be interested in our blade life and blade cost. We have found that with an original blade and having it reground once, we are able to cut 100 square inches. The cost of the blade being as low as...

Trimming the worn impression from the face of a 20" x 24" die block with a No. 24 MARVEL Universal Hydraulic Roll Stroke Hack Sawing Machine. Average Blade Cost \$.0108 per square inch.

Write for Catalog of MARVEL Modern Metal Saws



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Machine Tool High Spots

Business Outlook—Stop and Go

Capacity cutbacks predicted . . . But then business pace will quicken . . . New government orders, increased car output and easing of materials to up tool demand—By E. C. Beaudet.

It looks like a tough winter but an early spring is expected. This weather forecast might be applied to the climate of machine tool business during the next five months. With industry backlogs still declining informed sources believe there will be a loss in machine tool capacity during the winter months, but this will be followed by a speed-up of business activity.

A good many firms in the industry are actively seeking new business to fill out their shrinking order books. What's more they are promising normal delivery. It's expected that things will get worse before they get better. Industry backlogs will drop below their present 11-month level before they go up again.

Employment Cuts—Gradual tapering off of machine tool orders for defense is one reason for the drop in business following the hectic activity brought on by Korea. Due to declining defense business some tool plants which built up capacity to meet Korean demand, will be forced to lay off workers during the winter months. Expected cuts in subcontracting will also reduce capacity.

Loss of machine tool capacity is one of the things the government doesn't like to see happen. When capacity is reduced it is difficult to build it up again.

Craftsmen are quickly snapped up by other industries not subject to the fluctuations of the machine tool trade. Subcontractors return to their original line of work and are unavailable when needed again. Materials restrictions, which once made it desirable for subcontractors to take on machine tool business, are easing. This may induce many of them to return to their former lines.

New Orders—Although there may be a loss of capacity, indications are that machine tool business will take a turn for the better next spring. One reason is the expectation of another slug of government orders.

Washington reaction on the interim report of the Vance Committee seems to have been favorable. There is no indication that the incoming administration will take a less favorable view. The report calls for a build-up of production capacity rather than the manufacture and stocking of military end items as the method to prepare for a national emergency. To increase the nation's productive capacity, many new government orders will have to be placed for machine tools.

Government programs, some pending, some now in effect, which call for production of certain end products will create greater demand. If necessary appropriations are made, and the Navy finally decides to go ahead with its propulsion program, a considerable num-

ber of orders will be placed for heavy machine tools. Requirements of this program will be difficult to meet because they can be filled by only a relatively small segment of the industry. Long lead time required to build the necessary equipment adds to the difficulty.

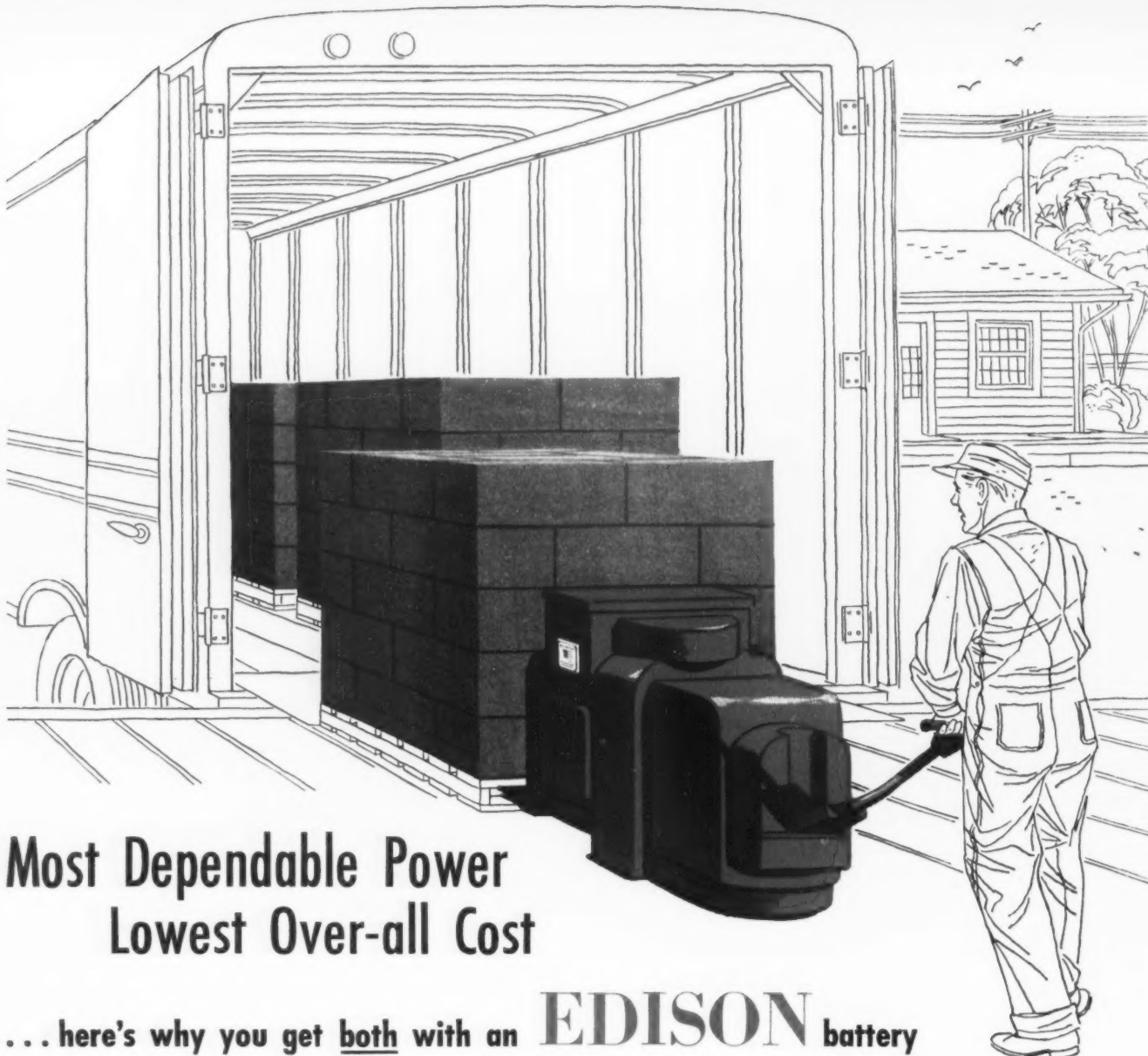
Jet Program—Of much greater impact will be the continuation of the Air Force's jet engine program. A lot of orders for jet engine production are expected in 1953. This increase will result in a great number of orders for both standard and special machine tools.

On the civilian front, freeing of materials is expected to result in a greater demand from all parts of industry. Some of the heaviest business next year is expected to come from automotive manufacturers. Chevrolet will be in the process of tooling up two plants, one in Buffalo and the other in Flint. Pontiac will require more machine tools for its new V-8 line. Mercury and Ford will still be taking a lot of equipment, and several other automobile manufacturers are expected to come in later in the year. Growth in replacement business for all industries is also anticipated.

Tank Cutback — The Defense Dept.'s cutback in production of medium tanks and 2½-ton trucks will have little effect on machine tool backlogs. A few tools ordered for replacement purposes will be cancelled but this amount will be negligible.

Machine tools for these programs were almost entirely produced and installed when the cutback was announced. Of greater importance to the machine tool builders was the government's assurance that the automobile manufacturers will be permitted to build 1.5 million passenger cars in the second quarter of 1953 if they can find the metals. Freer supplies of steel during the coming year may enable auto makers to reduce the purchase of high priced "conversion" steel.





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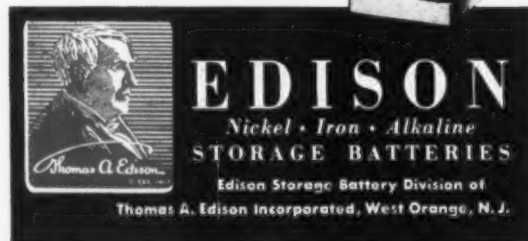
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Most Dependable Power—Lowest Over-all Cost

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Output May Double in Next 25 Years

Canada exploits its great mineral supply . . . Is major exporter of metals . . . Steel capacity grows . . . Predict big climb in population . . . Explore minerals lands—By F. Sanderson.

Canada, a world leader in natural resources, is beginning to exploit them in impressive volume. Industrial expansion has been even more pronounced in the past 4 or 5 years. The result: Canada is not only self-sufficient in nearly all metals but now is one of the major world exporters. In iron and steel, with capacity close to a 5 million-ton annual rate, Canada is reaching for independence from imports—with the exception of some lines of steel that have not yet been introduced into its manufacturing field, chiefly because of limited demand and consequent high production costs.

Double Production—Dr. O. J. Firestone, economic adviser to the Dept. of Trade and Commerce, predicts that Canada's national production may more than double during the next 25 years—climbing to more than 60 billion by 1977. He also predicts that Canada's population will rise from about 14 million to over 23 million in the same period.

Dr. Firestone painted a picture of a strong economy in the future, built on expanding consumer purchasing power, bigger exports and increased investments in the Canadian economy. He said that those who look to the future with caution and see the bogey of depression around every corner will lose opportunities to the "enterprising and the bold."

Mineral Exploration — Joseph Smallwood, premier of Newfoundland, completed a major concession-financing deal last week. It is expected to be the forerunner to a widespread exploration program of the mineral deposits of both Newfoundland and Labrador.

The agreement as it now stands means that British interests will head the new scheme for exploiting the natural resources of Mr. Smallwood's territory. Canadian groups will take a minority position. The financing group will be headed by N. M. Rothschild & Son, which will enter the Canadian field as soon as the agreement is formally ratified by the Newfoundland legislature.

While full details of the agreement are not yet available, it is learned from good authority that talks covered participation in both Newfoundland and Labrador.

Agreement Details—The British interests propose forming a \$10 million Newfoundland company. Subject to approval from the United Kingdom treasury, they plan to spend not less than \$1,250,000 within 5 years on exploration and development of natural resources. The company is to be given an option to retain the right for similar expenditure for three additional 5-year periods.

According to original talks the new company would have the right to prospect on all unissued concessions covering both Newfound-

land and Labrador and would be entitled to hold the timber, surface and mineral rights on a total of 50,000 square miles in Labrador eventually. In addition the company is to be granted two prospecting seasons, plus 6 months, to select for attention lands originally committed to other concessionaires but surrendered under agreement.

Original talks also covered prospecting rights over Newfoundland to subsequently give the company the right to timber, surface and mineral rights over 20,000 square miles. Eventually the company could exchange ground secured under the special prospecting rights for ground in the original concessions.

Iron Ore Find—A new major iron ore discovery has been made in the far north section of Quebec, reports Cyrus Eaton, of Cleveland, who is chairman of the board of Steep Rock Iron Mines Ltd. The find was made by Ross Toms of Toronto. With the help of Eskimos he quietly staked over 2000 iron bearing claims in an area lying some 400 miles beyond Burnt Creek.

Mr. Eaton said that the iron ore, of medium and lower grades, is of almost unlimited tonnage. He said it is on surface and easily mined by open pit operations. The ore is so located that water transportation to Europe would be the logical route for a market.

Steel Expansion—Steel Co. of Canada Ltd.'s \$60 million expansion program is nearing completion. Last week Stelco's new and largest blast furnace was fired and a few days later the new openhearth shop with four 275-ton furnaces went into operation.

The new blast furnace will produce 1400 tons of iron a day. It is equal in size to any in the world. The new openhearth unit will add 650,000 tons annually to the company's steel making capacity.



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Calcium metal

Crystalline Calcium Metal is a new booklet outlining Ethyl Corp.'s interesting crystalline powder which is available in pilot plant quantities. Suggested uses of crystalline calcium metal are for high-temperature reduction of refractory oxides such as titanium and zirconium; application as a reducing, condensing or polymerizing agent; for deoxidizing and desulfurizing steels and other alloys, and as an alloying agent with aluminum, magnesium. *Ethyl Corp.*

For free copy circle No. 1 on postcard.

Retaining rings

Waldes Kohinoor has just issued a new catalog packed with engineering specifications and other useful information covering 17 different types of Truarc retaining rings in more than 600 sizes. Designed to help engineers select retaining rings, the catalog has sections which illustrate typical cost-cutting applications and random field applications. Assembly and accessory tools for handling retaining rings are also illustrated and described. *Waldes Kohinoor, Inc.*

For free copy circle No. 2 on postcard.

Copper rods

After 3 years of preparation, the Copper & Brass Research Assn.'s Copper-Base Alloy Rod Handbook is available. The handbook is designed to provide pertinent data about free-cutting brass and other copper-base alloys in the form of rod for screw machine products and to assist the user in selecting proper copper-base alloys when conditions require that some special property of an alloy be emphasized. *Copper & Brass Research Assn.*

For free copy circle No. 3 on postcard.

Vise plates

Nava-Mar vise face plates are reported to adjust to any vise jaw. To make precision work easier, the plates have been angled, paralleled and surface finished. Thickness of the face plates is sufficient to permit a new surface to be ground after the facing has become scored. More information is contained in a new specification sheet. *Maroth Engineering Div., Kenimar Corp.*

For free copy circle No. 4 on postcard.

Tungsten carbide

Tungsten carbide products, including cutting tools, draw dies, bushings, gages, centerless blades, rolling mill work rolls, diamond wheels and wheel dressers, and solid carbide stock are covered in Metal Carbide's Corp.'s new general catalog. Extensive data is included on speeds, feeds, brazing and grinding wheels. *Metal Carbides Corp.*

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Casting

Taking the Mystery Out of Foundry Sand Control is an interesting 32-p. booklet covering molding sands. Among the aspects discussed are the selection and control of foundry sands. Detailed recommendations are made on testing methods. *Claud S. Gordon Co.*

For free copy circle No. 6 on postcard.

Flexible tubing

Flexible tubing for ventilation, fume and dust removal and materials handling is described in a new 8-p. bulletin put out by Flexible Tubing Corp. Two types of flexible tubing, are described, Spiratube A for ventilation, dust removal, fume disposal and similar applications and Spiratube R for materials handling. Flexflyte, a smaller diameter tubing for the same uses, is also covered. *Flexible Tubing Corp.*

For free copy circle No. 7 on postcard.

Pumps

Construction features of Allis-Chalmers small vertical pumps for side-wall or submerged mounting are described in a new 8-p. bulletin. Units covered are available in capacities up to 250 gpm at heads to 125 ft for coolant circulating, air conditioning and other purposes. Helpful tables to determine motor frame, hp, speed and current characteristics for the various units are included. *Allis-Chalmers Mfg. Co.*

For free copy circle No. 8 on postcard.

Engine lubrication

Alpha Corp. has issued a two-color folder describing the use of Kolykote lubricant for internal combustion engines. The lubricant is reported to minimize friction, protect bearing surfaces, give greater mileage and lengthen engine life. *Alpha Corp.*

For free copy circle No. 9 on postcard.

Steel selection

Guide to Steel Selection is a 4-p. bulletin which covers in condensed form the characteristics, mechanical properties and uses of a comprehensive list of hot-rolled and cold-finished carbon and alloy steel bars. The bulletin is designed to make comparisons of the different types of steel a simple matter. It is a helpful guide to the selection of the most suitable qualities of bar steel for jobs that are common in the average shop. *Joseph T. Ryerson & Son, Inc.*

For free copy circle No. 10 on postcard.

Radial drills

Electro-hydraulic power is used to actuate mechanical clamping devices on arm, head and column of all Carlton radial drills. Once any of these units is clamped or unclamped, mechanical devices hold them in position until the electro-hydraulic power is applied again. Electric power is used only in clamping or unclamping so noticeable savings in electric power consumption result. Further information on the Carlton push-button clamping system is described in a new brochure. *Carlton Machine Tool Co.*

For free copy circle No. 11 on postcard.

Batteries

A new 20-p. catalog has been published to help industrial users select and install the proper glass-jar batteries in control, alarm, telephone, switchgear and signaling services. Among the topics discussed are uses and proper installation procedure for Flote, Plante and other types of stationary batteries. *Gould-National Batteries, Inc.*

For free copy circle No. 12 on postcard.

Taps

DoAll Co.'s line of taps is covered in a new brochure. Types shown and described include hand, machine screw, nut, pulley, pipe, tapper and hook taps. Instructions for ordering special taps are given and there are handy charts which list all drill sizes for various thread dimensions. *DoAll Co.*

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are not usually required. Easy as that to cut your maintenance costs. Specify **RUST-OLEUM** to your painting contractor or architect for *every rustable* metal surface! Prompt delivery from Industrial Distributor stocks in principal cities.

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Steel-strapped pallets at Locke Department of General Electric Company.

Packing expense cut 35% by Brainard Strapping Service

THESE porcelain insulators were formerly packaged in individual cartons. Then Brainard strapping salesman Edward Rose of Baltimore, in cooperation with his customer's Packing Engineer, developed this method of loading groups of insulators on a returnable pallet, and securing the entire unit with Brainard steel strapping.

Excessive breakage of previous fasteners used has now been eliminated, and packing expense cut 35%.

Developing improved methods of materials handling and shipping is a standard service of Ed Rose and his fellow Brainard salesmen. They are qualified

to study your operations, then recommend and demonstrate the most efficient system for you.

Call your nearby Brainard salesman for top-notch service in steel strapping. Offices located throughout the U. S. In Canada: P. J. McArthur Company, Toronto.



COMPLETE STEEL STRAPPING SERVICE. LIGHT AND HEAVY DUTY STRAPPING, TOOLS AND ACCESSORIES



Write for illustrated catalog, Brainard Steel Division, Sharon Steel Corp., Dept. O-12, Griswold Street, Warren, Ohio

WARREN, OHIO

Free Publications

Continued

Corrosion prevention

Two new illustrated bulletins on volatile corrosion inhibitors designed to protect ferrous metals and aluminum from rust and corrosion without using oil or grease coatings are offered by Berlin & Jones Co., Inc. Technical Bulletin VT-1 covers VCI and VPI corrosion inhibiting packaging paper in basic terms. General Bulletin GB-1 deals specifically with Berlin & Jones Dry Vapor Pack-velopes which are reported to provide a protective packaging for steel and aluminum. Free samples of the envelopes are also offered. *Berlin & Jones Co., Inc.*

For free copy circle No. 14 on postcard, p. 107.

Metalworking

Niagara's machines and tools for light gage sheet metal work are outlined in a new pocket-sized booklet. The booklet covers a wide variety of units designed for sheet metal shops, ranging from electric combination machines to small hand tools. *Niagara Machine & Tool Works.*

For free copy circle No. 15 on postcard, p. 107.

Electrical controls

Magmamp is a regulating system designed for steel mill drives. It has no moving parts, is fast acting and is built for rugged duty. Typical applications are: For package mill drives, for ignitron rectifiers on hot strip mills, as speed regulators in rod and merchant mills. Complete details are available in a new bulletin. *Westinghouse Electric Corp.*

For free copy circle No. 16 on postcard, p. 107.

Drill chucks

Continental stub drill chucks, used in multiple spindle heads, cut costs in drilling through bolt holes or clearance holes. Supported in rigid true-running spindles, these chucks project a minimum distance and use short drills so that bushings and bushing plates are not required. This setup is said to increase drill life substantially. Complete details are available in a new circular. *Continental Tool Works, Ex-Cell-O Corp.*

For free copy circle No. 17 on postcard, p. 107.

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dolomites it's...
BAKER'S
MAGDOLITE**

The J. E. Baker Company takes pride in announcing the completion of its new, modern plant in York, Pennsylvania. This new operation, supplementing our other plants in Eastern Pennsylvania and Ohio, will enable us to meet the increased demand for dolomite necessitated by the tremendous expansion of the steel industry. Yes, we can now assure you of the kind of dependable dolomite shipments that the people in the steel industry have needed—and to a larger area.

The superior quality of this new source of dolomite means the continuance of BAKER'S MAGDOLITE'S leadership within the industry...and guarantees top performance for you. Yes, those who know insist on BAKER'S MAGDOLITE...the original deadburned dolomite!

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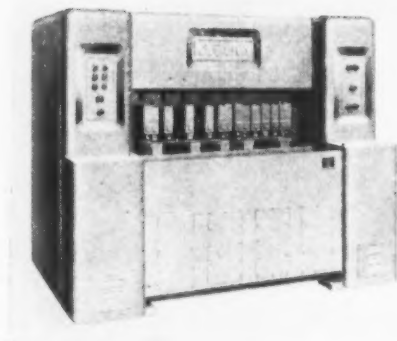
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PLANTS: York, Billmeyer, Pennsylvania • Millersville, Ohio

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 107 or 108.

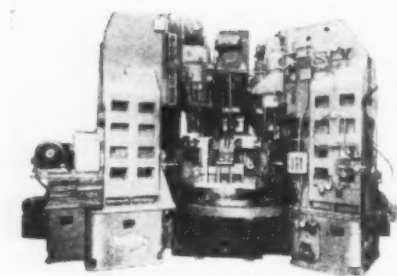


Distortion held to minimum in quench machine

A rolling quench machine is designed for holding and quenching heated shafted parts so that they may be hardened with a minimum of distortion. The hot part to be quenched is placed on the lower rollers and the start buttons depressed until the quench cycle starts. From this point on, the entire operation is automatic. Rollers hold the part straight and concen-

tric while it rotates throughout the quench. This is said to eliminate need for straightening the part after quenching; the controlled forced quench assures uniformity of hardness and a minimum of distortion. Machine is designed for oil, but can be used for water or caustic soda by changing a few parts. *Gleason Works.*

For more data circle No. 18 on postcard, p. 107.

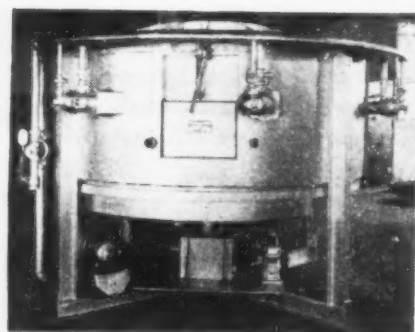


Performs multiple operations on clutch housings

Multi-operation machine utilizing standard Baker 7½x16 and 15x16 units and a 72-in. six-station power indexing table, performs drilling, chamfering, boring, counterboring and tapping operations on clutch housings at the rate of 80 parts

per hr at 100 pct efficiency. Units are mounted in horizontal, vertical and angular planes. Baker special drilling machines are arranged to suit each individual problem. *Baker Bros., Inc.*

For more data circle No. 19 on postcard, p. 107.

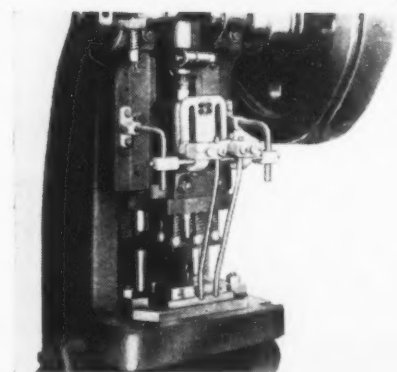


Rotary hearth furnace has long flame burners

This gas fired rotary hearth furnace has a hearth 7½ ft OD with a 30-in. column. Chamber height is 15 in. The center column on the hearth forms a doughnut-shaped heating chamber. Burners fire tangentially of the inner lining and against the direction of rotation of the table. Furnace is controlled by means of a Leeds & Northrup strip

chart controlling instrument. Drive mechanism and the blower are mounted on the base. The top is a separate structure, and removable in one piece. The furnace is suited for continuous operation of either forging or heat treating and can be used for temperatures of 1200° to 2300°F. *Waltz Furnace Co.*

For more data circle No. 20 on postcard, p. 107.



Press guard arms have sweeping motion

Simplicity of design and positive, easy action of a safety guard for forming and secondary operations on power presses up to 4-in. stroke convert any press within this range from a dangerous machine into a safe one. Actuated by the press ram, two guard arms, with a sweeping motion push the operator's hands safely away from the

danger area as the ram starts to descend. So natural is this motion that protection is positive, increasing operator confidence and allowing full concentration upon production. Guard arms may be arranged to suit specific applications. *Cooper Weymouth, Inc.*

For more data circle No. 21 on postcard, p. 107.

Turn Page

THE AETNA-STANDARD ENGINEERING COMPANY



SEAMLESS TUBE MILLS

ASSOCIATED COMPANIES

- Head Wrightson Machine Company, Ltd., Middlesbrough, England—Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.
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Aetna-Standard

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Plants in Warren, Ohio • Ellwood City, Pennsylvania

New Equipment

Continued



Gap type presses for forcing, straightening

A complete line of hydraulic gap type presses for forcing and straightening operations are available in 11 standard models for each operation, with capacities of 15 to 300 tons. Straightening presses have self-contained power unit, and adjustable stroke control for both directions of stroke. A combined hand and foot lever provides sensitivity, permitting operator to in-

crease pressure to maximum by increasing pressure on control valve. Forcing presses have a two-speed ram advance and extra large table, permitting a wide variety of operations. Stroke can be preset for both directions by an adjustable stroke limit cam. Semi-automatic and automatic cycling can be provided. *Dake Engine Co.*

For more data circle No. 22 on postcard, p. 107.

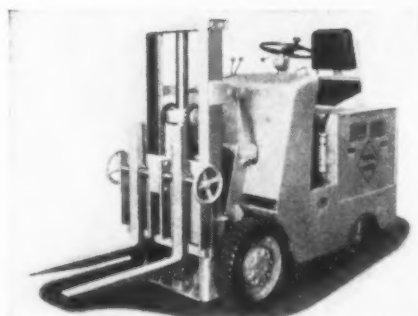


Air-inflated grinders reduce polishing time

Production is doubled at Claus Mfg. Co. by using air-inflated grinders for grinding welds and polishing stainless steel. The grinders—one 5 in. diam x 3½ in. wide, the other 3¼ in. diam x 3 in. wide—consist of a rubber drum mounted on a core assembly. The operator slips an abrasive band over the drum and then inflates the drum with

from 3 to 10 lb of air. Grinders can be used with any kind of power tool for any type of grinding or finishing job. Resiliency of this type grinder permits greater abrasive contact area, eliminates chatter and bounce, enables the grinder to polish contours more efficiently. *Nu-Matic Grinders, Inc.*

For more data circle No. 23 on postcard, p. 107.



Special device for rapid fork adjustment

Screw adjusting forks are available for Elwell-Parker's gas and electric powered fork trucks. The device consists of a frame which attaches to the standard load elevator. This frame supports a pair of large diameter screws with machine cut Acme screw threads. The forks are supported on these screws

and can be moved laterally as the screws are turned. This permits independent action of either fork. Hand wheels, or a detachable crank handle operate the screw. The device permits frequent fork adjustments, yet maintains positive positioning. *Elwell-Parker Electric Co.*

For more data circle No. 24 on postcard, p. 107.

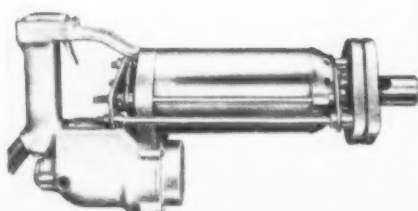


Gage gives direct reading of hole spacing

With the Center-Mike, inspectors can measure distance between hole centers quickly and accurately without knowing diameters and without mental figuring or pencil work. The gage produces a direct reading of center distance. It is a vernier gage and a slide rule combined; requires

no setup and is ready for use on any combination of hole diameters within its range. Center-Mikes come in three sizes: for maximum center-distances of 4.400, 7.400, and 12.400 in. *Sorensen Center-Mikes, Inc.*

For more data circle No. 25 on postcard, p. 107.



Hammer drill speeds concrete hole drilling

New hammer drill combines power of Syntron's largest electromagnet hammer with automatic rotation of a spiral fluted, carbide-tipped drill bit. This automatic rotation is accomplished by a simple rubber ratchet mechanism which utilizes

the recoil of each blow of the hammer piston to slightly turn the bit. The 3600 blows per min of the hammer piston rotate the bit with considerable torque at the right speed. *Syntron Co.*

For more data circle No. 26 on postcard, p. 107.

Turn Page



Picture above of the wreck in which the tractor was demolished, while the tank Trailmobile of high-strength Otiscoley held its cargo intact; (below) the same trailer, thirty days later, after being rebuilt.



J&L OTISCOLOY
HIGH STRENGTH STEEL

plus

TRAILMOBILE
CONSTRUCTION

Saved the day for this cargo of gasoline

When forced off a Missouri highway, this gasoline tank Trailmobile went over a high embankment, turned over twice and landed upside down—but *did not lose a gallon of its highly-inflammable cargo*. The tractor pulling the Trailmobile was completely demolished.

Trailmobile Inc., renowned for superior trailers, made a smart move when they selected high-strength J&L Otiscoley Steel for Trailmobile construction. J&L Otiscoley (with twice the yield strength of mild steel) will stand up better and longer under the severe impact and fatigue conditions of modern trailer operation.

In addition, J&L Otiscoley's great strength per-

mits Trailmobile to employ lighter weight sections in the construction—thereby cutting deadweight—and permitting Trailmobile trailers to haul larger payloads within the legal weight limits.

Finally, equipment builders such as Trailmobile have found that the ease of welding Otiscoley lends itself to their production techniques and helps assure a strong, sound, finished product (as demonstrated in the photo above).

Why don't you check into the possibility of using J&L Otiscoley to advantage in your operation? Send for a free copy of our booklet: "J&L Otiscoley—The Transportation Steel." Or get in touch with the J&L representative nearest you.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH 30, PA.



JONES & LAUGHLIN STEEL CORPORATION

403 Liberty Avenue • Gateway Center, Pittsburgh 30, Pa.

Please send me a copy of your booklet—"J&L Otiscoley—The Transportation Steel."

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Company _____

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If your production involves
finishing zinc, cadmium,
aluminum or cuprous metals,
you owe it to yourself...
and your customers...
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IRIDITE®

for on any of these metals Iridite gives you a high performance finish at a low cost from a simple chemical dip.

IF YOU WANT HIGH CORROSION RESISTANCE,
you'll find an Iridite that will meet any military or civilian specifications for chromate finishing.

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you'll find Iridite prevents underfilm corrosion and soap formation.

OR, FOR BRIGHT, DECORATIVE FINISHES—

investigate zinc plate and Iridite (Bright) for a chrome-like decorative finish with more corrosion protection than conventional chrome plating... or Iridite (Metacote) as a treatment for copper that eliminates the need for buffing in the copper-chrome system; produces a sparkling bright finish!

Write for literature and send us samples for test processing. See "Plating Supplies" in your classified telephone directory or write direct.

Iridite is approved under government specifications.

ALLIED RESEARCH PRODUCTS INCORPORATED

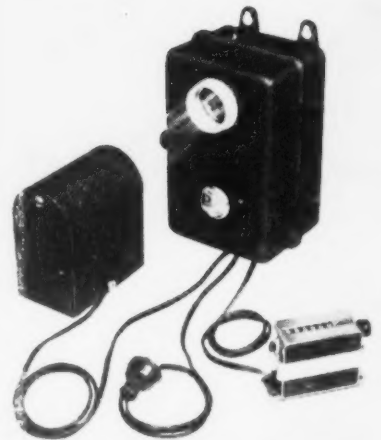
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Manufacturers of Iridite finishes
for corrosion protection and paint systems on non-ferrous metals; ARP Plating Brightness.

New Equipment

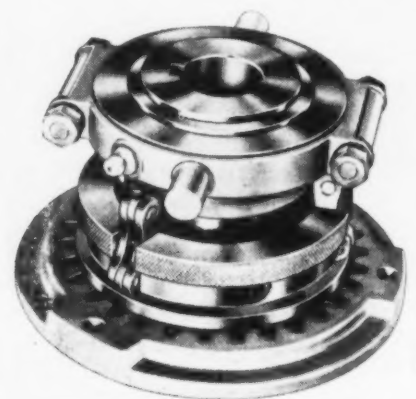
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Photoelectric counter

A completely packaged, easily installed, general-purpose photoelectric counter provides accurate answer for industrial counting problems. Counter Set PIC consists of a photoelectric control, light source, and electric counter. Control and light source are located at point-of-count. One or more electric counters may be placed at any convenient location and wired to the control. Remote counting is thus easily obtained. *Photoswitch, Inc.*

For more data circle No. 27 on postcard, p. 107.



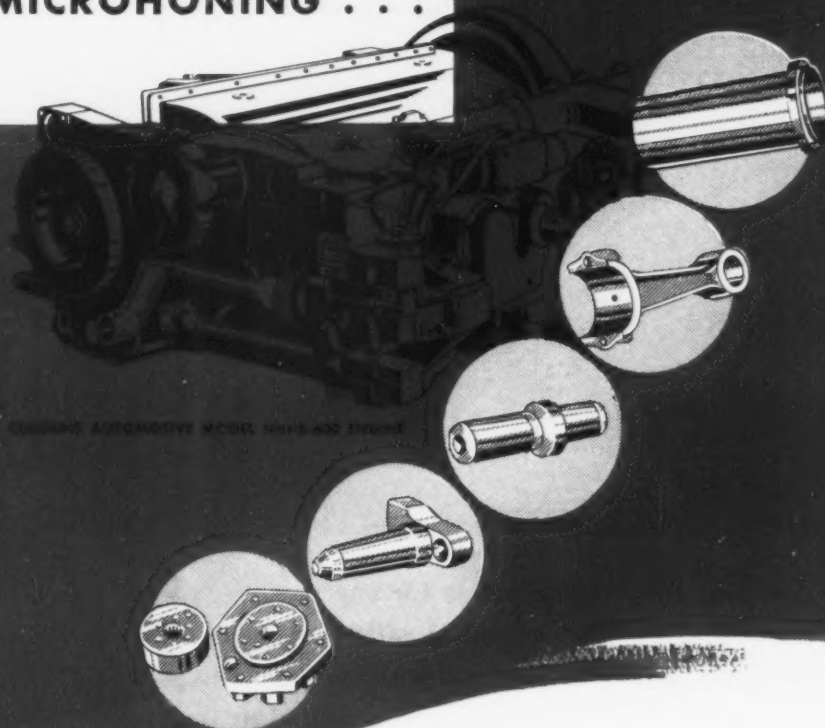
Floating disk clutch

New single disk clutch is designed for light machinery service up to 6 hp. It incorporates the floating disk principle: the disk rides free in neutral, preventing drag, abrasion and heating. A simple hex-key frees the knurled ring for easy manual clutch adjustment. *Carlyle Johnson Machine Co.*

For more data circle No. 28 on postcard, p. 107.

Turn Page

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For Information
on MICROHONING of
DIESEL ENGINE PARTS

Write for
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Diesel engines are chosen because of their dependable low cost power. The more precise the fit of parts, the more efficient the engine.

MICROHONING gives to functional surfaces of

- cylinder liners
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accurate size, true geometry, and the characterized finish—all at production rates.

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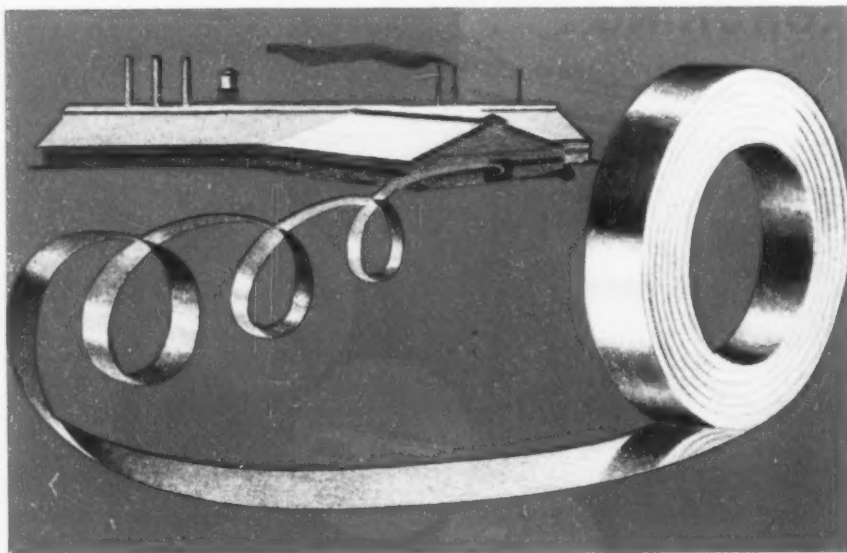
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Hallidie Machinery Co., 2726 First Ave., South, Seattle, Wash. • REPRESENTATIVES IN ALL PRINCIPAL COUNTRIES

FOLLANSBEE

COLD ROLLED STRIP

FOR

CUSTOM-QUALITY WITH CUSTOM-SERVICE



For your strip requirements for any type of production—specialty or run-of-mill—you may use Follansbee Cold Rolled Strip with complete assurance. It is rolled, tempered and supplied to your specifications. Follansbee Cold Rolled Strip provides a continuous supply of uniform steel from coils to your automatics, regardless of forming operations involved.

Follansbee Steel Corporation is set up to supply you with quick, direct, personalized service.

**Consult your trained Follansbee Steel representative.
He will be glad to discuss your
fabricating problems with you.**

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

POLISHED BLUE SHEETS AND COILS SEAMLESS TERNE ROLL ROOFING
COLD ROLLED STRIP

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Fairfield, Conn.

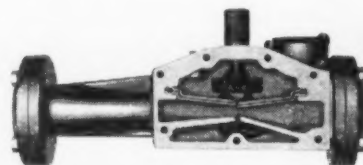


—New Equipment—

Continued

Combustion control

Changing heating loads on combustion equipment is simplified by a new Vari-Set mixer. A built-in, adjustable orifice eliminates replaceable jets, and changes volume



of automatically proportioned gas and air for any Btu output within the capacity of various sized mixers used in furnaces, ovens, kilns, and other combustion equipment. *Eclipse Fuel Engineering Co.*

For more data circle No. 29 on postcard, p. 107.

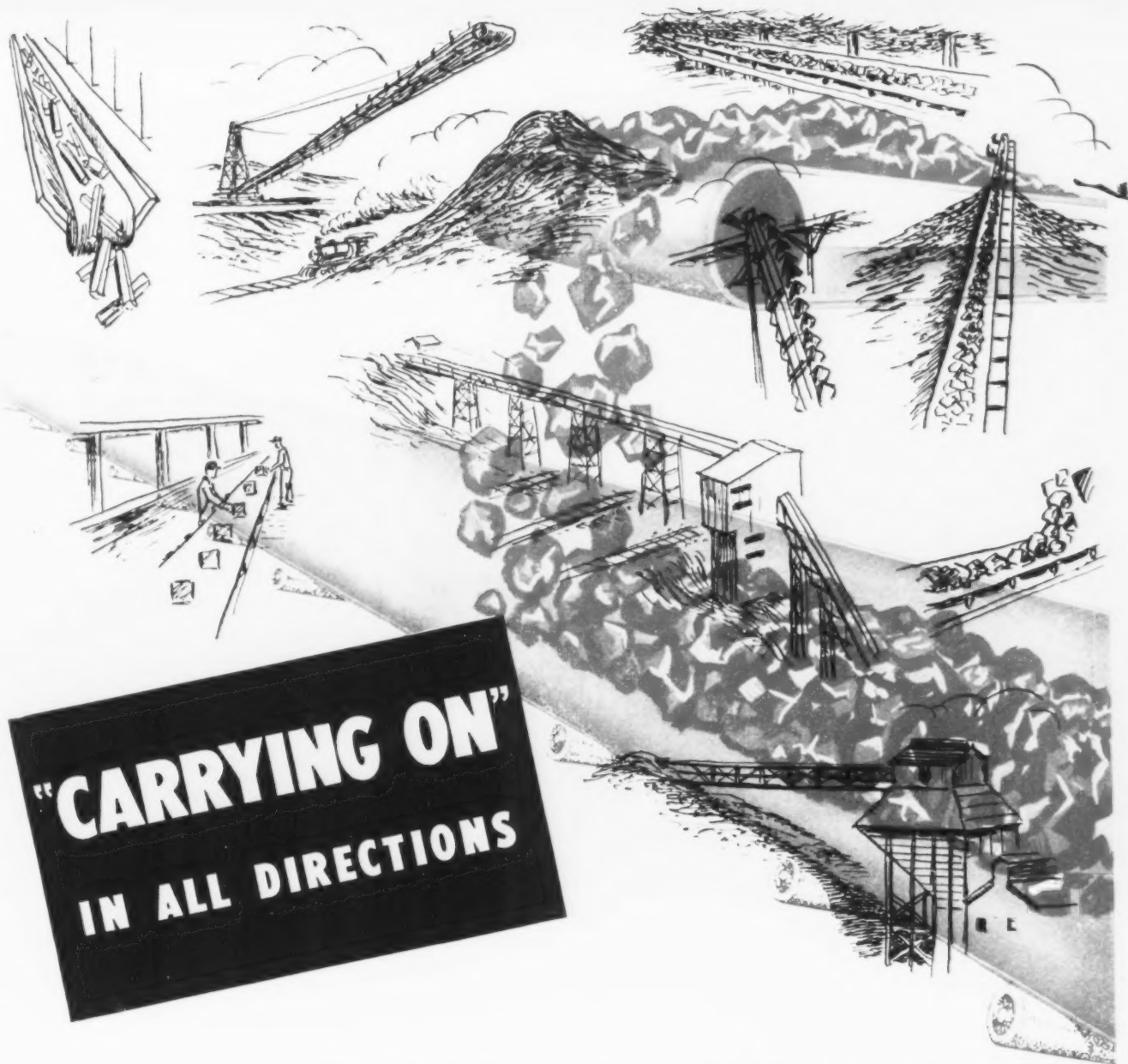
Powder metal press

Small shoulder pellets of powdered glass are being produced on the Stokes Model F-4 powder metal press on a round-the-clock schedule. Used in hermetic seals to protect sensitive parts in electronic equipment, the pellets are made in a wide variety of sizes. The press can be quickly adjusted from one pellet size to another. Many simple adjustments make possible easy regulation of almost any segment of the pellets dimensionally. *F. J. Stokes Machine Co.*

For more data circle No. 30 on postcard, p. 107.



Turn Page



**"CARRYING ON"
IN ALL DIRECTIONS**

Regardless of what you want to convey or where you want it to go, Raybestos-Manhattan has a conveyor belt engineered to carry the load . . . Belts for mining, quarrying or construction work that are unequalled for natural troughing, flexibility, tear resistance and ability to hold fasteners. There are R/M conveyor belts with extra-cushion features for heavy duty shock loading . . . Others for hot materials . . . Still others for high tensions, long lifts. Then too there are R/M belts for light duty—packages, parts, cases or cans • Conveyor belts may not be your problem today, but whenever you think of transmission, conveyor or V-belts—or *any* industrial rubber product—remember "Raybestos-Manhattan makes it", and call your R/M representative.



MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

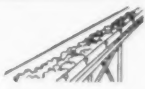
RAYBESTOS-MANHATTAN, INC.



Flat Belts



V-Belts



Conveyor Belts



Hose



Roll Covering



Tank Lining



Abrasive Wheels

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Packings • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Sintered Metal Parts • Bowling Balls

Threaded Specialties to Class 3 Fit



For years Pawtucket has specialized in specialties — of any size, in any metal, to any specifications.

Two items have become widely used because of their lower cost, more accurate fit and greater-than-needed strength. Pawtucket's eye bolts and tee-head bolts are made by an exclusive process that guarantees all these advantages.

For these and any other threaded specialties, save by seeing Pawtucket — "The Bolt Man".

BETTER BOLTS SINCE 1882

"THE BOLT MAN"



T.M. REG.

PAWTUCKET

MANUFACTURING COMPANY

327 Pine Street · Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS

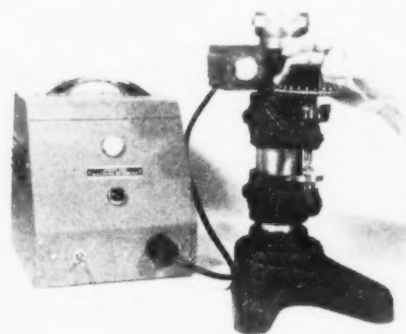
New Equipment

Continued

Steam hose

Ironsides Steam Hose features wire braided and glass cord construction. Its inner braids of wire give high burst resistance; glass cord outer braid provides additional strength, and a higher degree of insulation. Both tube and cover are constructed of heavy gage Ebonite heat resistant compound. It is developed for finishing work found in steel mills, refineries, foundries and all types of steam cleaning. *Quaker Rubber Corp., Div. H. K. Porter Co., Inc.*

For more data circle No. 31 on postcard, p. 107.



Pressureless measuring

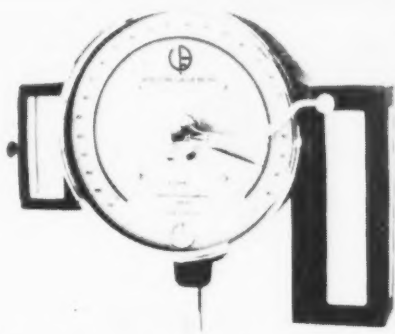
New electronic micrometer permits measurements to 0.00002 in. without any measuring pressure being exerted on the work. All measurements are direct measurements. Measuring head consists of an extremely accurate micrometer screw. Electronic circuit gives a visual indication at the moment of contact but before pressure is exerted. The Model W is designed for use in research, development and performance testing of springs, diaphragms and bellows. *J. W. Dice Co.*

For more data circle No. 32 on postcard, p. 107.

Ratchet wrench

Open end ratcheting socket wrench permits the introduction from any side of the socket over and completely around a pipe or tube and straight down on the fitting. There the socket engages nut or bolt and speedily ratchets it off or on as fast as the arm can swing. Production and maintenance operations are claimed to be cut by 25 to 90 pct on hard-to-reach time consuming jobs. *Tubing Appliance Co.*

For more data circle No. 33 on postcard, p. 107.



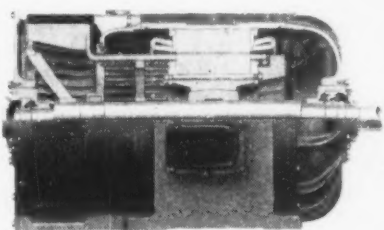
Torque balances

In drawing and finishing of tungsten wire or similar materials a precision torque balance measures weight per unit length. The balance is simple to operate and large numbers of accurate weighings can be made in a short time. Its torsion system eliminates mechanical axle friction. A special damping device speeds weighing, but does not affect the sensitivity. Other features include eye level reading resistance to shock. *Ohaus Scale Corp.*

For more data circle No. 34 on postcard, p. 107.

High-slip motor

New totally enclosed, fan-cooled, high-slip induction motor is designed for use in acceleration of high-inertia loads such as punch presses, centrifuges, hoists. The KRX is 30 pct smaller and 40 pct lighter than conventional models. Space and weight reduction is the



result of the motor's new extended-bar design which provides efficient dissipation of the increased heat normally generated by high slip motors. Most of the rotor heat develops where there is a direct transfer to the cooling air—outside the motor enclosure. Available in 30 to 150 hp at 900 and 1200 rpm, 5-8 and 8-13 pct slip. Voltage ratings are 220, 440 and 550. *General Electric Co.*

For more data circle No. 35 on postcard, p. 107.

Turn Page

December 18, 1952

NONE BETTER... America's First and Safest

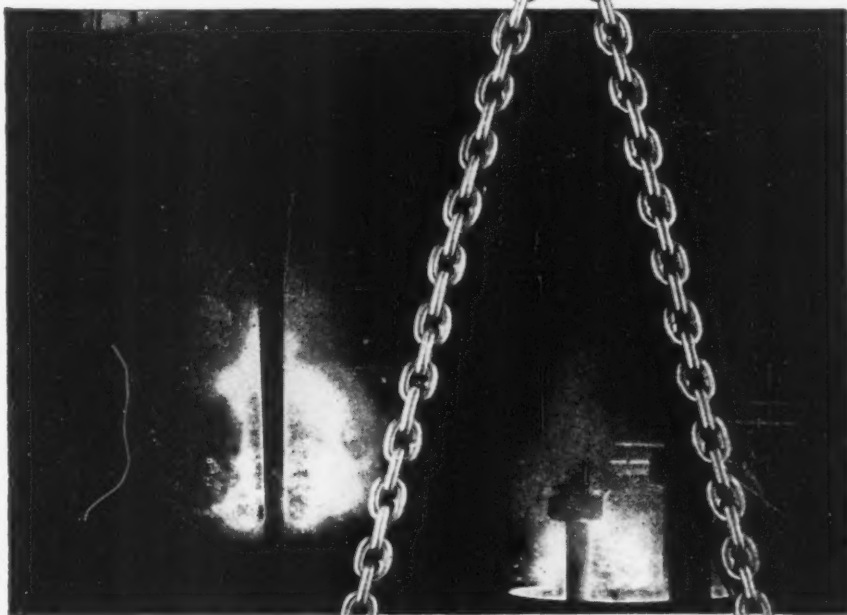
HERC-ALLOY

SLING CHAINS

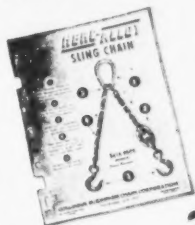
STRENGTH—Size for size, no other sling chain offers a greater tensile strength. HERC-ALLOY will not crystallize—never requires annealing.

SAFETY—HERC-ALLOY Sling Chains are made to your specifications. Every new sling carries a written guarantee, is registered and tested before shipping. This registration serial number is carried at the top link.

● Serial number permanently affixed near top link for positive identification.



● Identify HERC-ALLOY by the patented Inswell side weld with the extra swell of metal on the inside of the link.



EFFICIENCY—Lighter, stronger HERC-ALLOY Sling Chains feature the exclusive short, narrow link design which holds firmer, less tendency to kink, less gouging. Workmen handle HERC-ALLOY with less effort.

PREFERENCE—Men who buy and use sling chains are influenced only by facts learned through experience. HERC-ALLOY Sling Chain preference has been built up over the years, not just by what we say, but by how HERC-ALLOY performs on the job.

Write for Data Book No. 3 which contains much useful manufacturing and application information on HERC-ALLOY Sling Chains.

COLUMBUS MCKINNON CHAIN CORPORATION

(Affiliated with Chisholm-Moore Hoist Corp.)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.

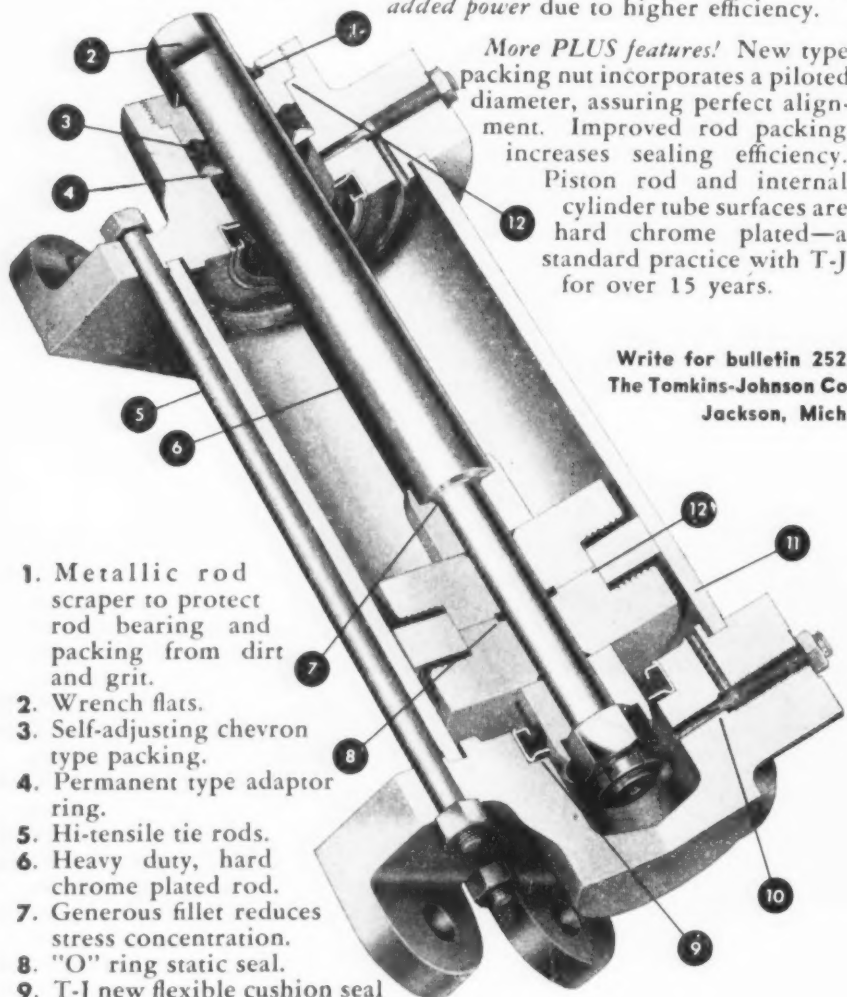
District Offices: New York • Chicago • Cleveland

Other Factories at Angola, N. Y., Dixon, Ill., St. Catharines, Ont., and Johannesburg, South Africa.

New Flexible Sealing... T-J AIR CYLINDER

Designed with revolutionary application of
Super-Cushion

It's sealed with pressure—a revolutionary T-J application of flexible sealing that insures positive cushion action combined with automatic valving action for fast return stroke... eliminates binding and sticking... operates with *low friction, minimum wear, and added power* due to higher efficiency.



More PLUS features! New type packing nut incorporates a piloted diameter, assuring perfect alignment. Improved rod packing increases sealing efficiency. Piston rod and internal cylinder tube surfaces are hard chrome plated—a standard practice with T-J for over 15 years.

Write for bulletin 252.
The Tomkins-Johnson Co.
Jackson, Mich.

1. Metallic rod scraper to protect rod bearing and packing from dirt and grit.
2. Wrench flats.
3. Self-adjusting chevron type packing.
4. Permanent type adaptor ring.
5. Hi-tensile tie rods.
6. Heavy duty, hard chrome plated rod.
7. Generous fillet reduces stress concentration.
8. "O" ring static seal.
9. T-J new flexible cushion seal insures positive cushion with automatic valve action for fast return stroke. (Patent applied for)
10. Fine cushion adjustment.
11. Heavy wall precision honed hard chrome plate.
12. Controlled packing compression with metal to metal contact.

36 YEARS' EXPERIENCE

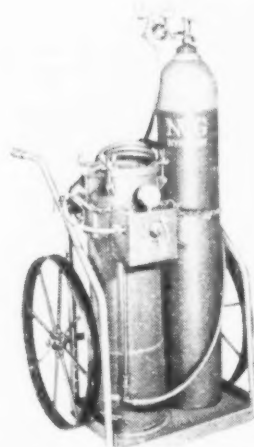


TOMKINS-JOHNSON

RIVETORS... AIR AND HYDRAULIC CYLINDERS... CUTTERS... CLINCHERS

New Equipment

Continued



Powder-cutting unit

New Ferrojett powder dispensing unit for powder-cutting stainless and alloy steels provides greater uniformity of powder flow as a result of improvements in the powder regulating and ejecting mechanisms. It is simpler and more compact than the former model. Gas pressure and rate of powder flow are maintained automatically by the dispensing unit. Powder control valve is also automatic, operating simultaneously with the turning on and shutting off of the cutting oxygen valve on the torch. *National Cylinder Gas Co.*

For more data circle No. 36 on postcard, p. 107.

Glass safety hat

New Saf-Hed-Hat made of fiber glass fills the need for a rugged safety hat with longer life that is lightweight and comfortable to wear. Manufacturers of the hat state it meets A.S.A. Code for dielectric breakdown and exceeds the Code for impact resistance. Cradle of hat is adjustable to fit all head sizes, and complies with federal specifications. *U. S. Safety Service Co.*

For more data circle No. 37 on postcard, p. 107.

Descaler

A dry, free-flowing acid compound removes rust and scale from steels and alloy steels. The product is dissolved in water in concentration range from 4 oz to 3 lb per gal. It gives a controlled acid concentration to prevent overpickling; is suitable for tank or vat pickling, for barrel or tumble descaling or derusting. *Enthone, Inc.*

For more data circle No. 38 on postcard, p. 107.

Spare parts storage

Compact, rotating, storage unit simplifies storage and handling of small spare parts such as nuts, bolts, rings, etc. The unit consists of series of circular trays accommodating glass jars of various sizes. The complete tray assembly revolves as a single unit on ball bearings. Jars are easily removed but cannot tip or fall. Eight, five and three-tray models are available. *Union Metal Mfg. Co.*

For more data circle No. 39 on postcard, p. 107.

Paint-on solder paste

New paint-on solder paste combined with flux, trade-named Eutectinweld, is claimed to increase speed of application while cutting waste to a minimum. It can also be used as a tinning compound. Tinweld is a specially formulated lead-tin-solder that is pre-mixed, in paste form, in proper proportions with its specially compounded accompanying flux. Resultant product is said to yield a capillary flow similar to silver solder. Flux residue which is small, may be washed off with plain water. Brush, spatula or dip application can be used. It can be used with torch, furnace or soldering iron to join all metals except aluminum and magnesium. *Eutectic Welding Alloys Corp.*

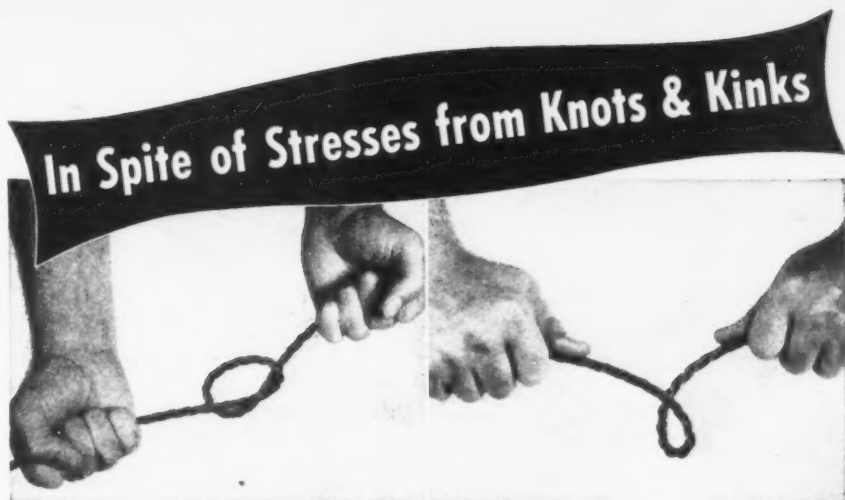
For more data circle No. 40 on postcard, p. 107.



Electro-porcelains

Die-pressed porcelains, made from finest American and imported raw materials, for all electrical applications, are produced by the dry-mix process and supplied either glazed or unglazed in white or gray-green. The company offers custom molding to customers' own designs and can also provide engineering advisory service on specific application requirements. *Washington Porcelain Co.*

For more data circle No. 41 on postcard, p. 107.



Tuffy SLINGS

Last Longer to Help You Cut SLING COSTS

BRAIDED CONSTRUCTION is the Reason!

Knot it! Kink it—if you can! See how easily the patented braided construction of Tuffy Slings straightens out without damage. Only Tuffy gives you this extra flexibility and long-life strength—because ONLY TUFFY has this 9 part machine-braided wire fabric construction that fights off knots and kinks, yet stands up longer when such stresses of distortion happen. Mail coupon for your FREE 3-ft. sample of Tuffy Sling fabric and test it yourself!

A Steel Company Reports: "...outlasted former slings 3 and 4 to one."

One month's service was tops—until Tuffy showed how they could get 3 and 4 times longer service—at big savings on sling costs.

SEND FOR THIS FREE BOOK!

Get the facts—and save! Here's useful data on 12 braided sling types . . . various types of sling fittings, 30 illustrations of sling uses, information on splicing Tuffy Slings and Wire Rope. It's yours for the asking! Mail coupon today!



union  **Wire Rope corporation**
Specialists In Wire Rope and Braided Wire Fabric

2232 Manchester Ave., Kansas City 3, Mo.

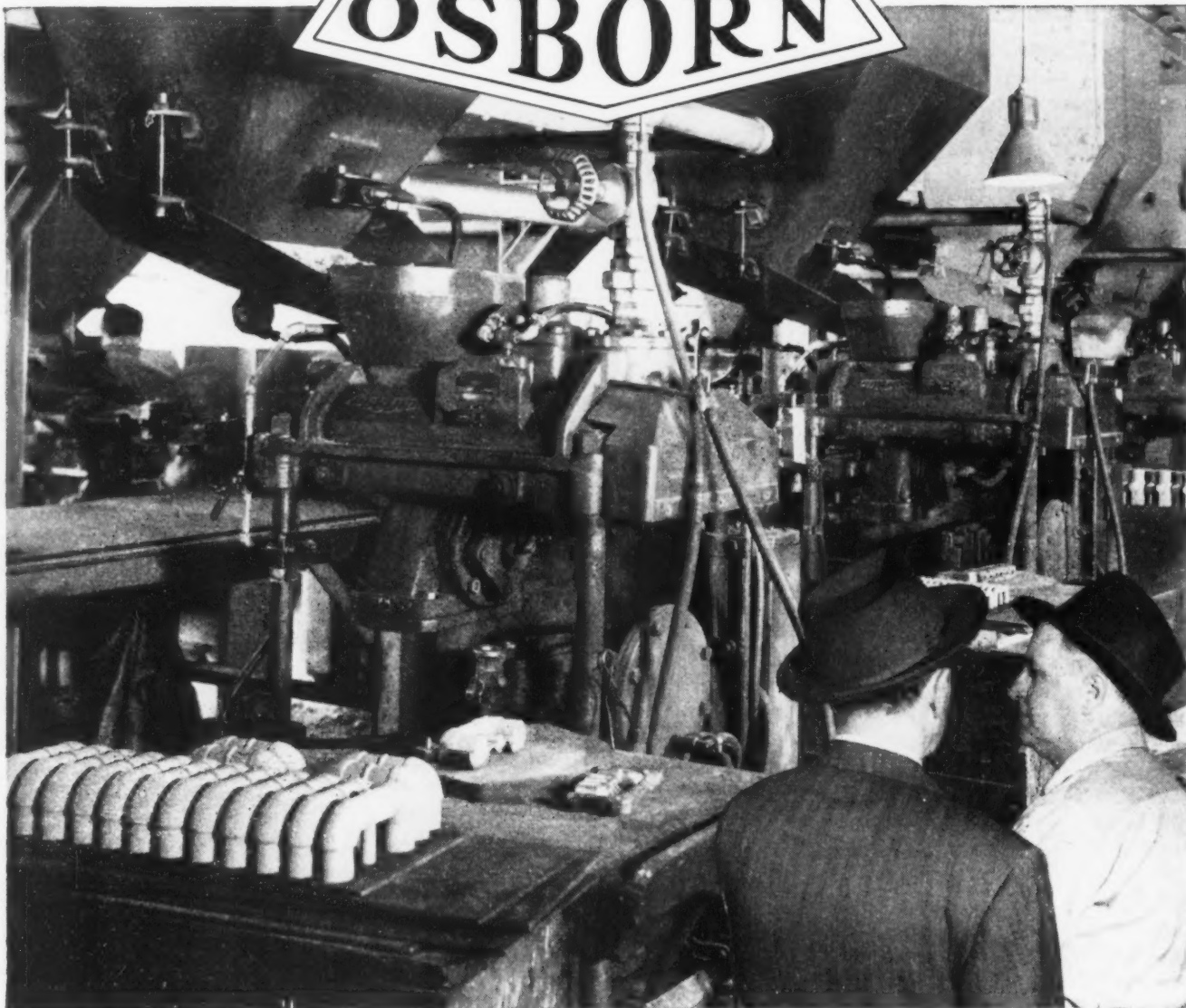
- ☐ Send FREE Tuffy Sling Handbook and Rigger's Manual
- ☐ Have my Union Wire Rope Fieldman deliver to me FREE a 3-Ft. sample Tuffy Sling

Firm Name _____

By _____ Title _____

Address _____ City _____ State _____

OSBORN



AUTOMATIC OSBORN CORE BLOWERS

...cut your core making costs!

Simplifies Production. With this Osborn core blower, the operator has only to insert the core box into the machine. The machine then does the rest . . . automatically blows the core and ejects the box. While one core is being blown, the operator is free to remove the core from the other box.

Result . . . more cores per day, uniform quality of cores, lower cost per core.

Undoubtedly substantial cost savings are possible in your foundry core department through automatic operations like this. Why not have an Osborn factory-trained foundry molding specialist analyze your re-

quirements. From Osborn's complete line of core blowing and molding machines he can recommend the latest production tested methods to lower your costs . . . make your foundry a better place in which to work.

Call or write *The Osborn Manufacturing Company, Dept. 912, 5401 Hamilton Avenue, Cleveland 14, O.*

Serving the Foundry Industry for Over 43 Years

Osborn Molding Machines

MOLDING MACHINES . . . CORE BLOWING MACHINES . . . INDUSTRIAL BRUSHES

The **Iron Age**

SALUTES

Homer H. Dasey

This ex-editor saves industry money by his ingenious scale models for better planning.



IN a madeover chicken house in Oakmont, Pa., an ex-magazine editor is grossing half-a-million-a-year showing industry how to save money through better plant layout.

He's Homer H. Dasey, a man who nurtured a big idea through 3 years of hard-sell to industry. But when cost-sensitive executives decided "yes," they moved fast to cinch the answer to two plant management headaches: How to work more efficiently within four walls, and how to better plan the needs of tomorrow.

With Homer's scale models, management men began to see their own plants in a new, objective, 3-dimensional perspective. In-plant problems were more easily analyzed. Expansion-minded executives could give architects a completely functional machine for working and say, "Build the shell."

Spurned by the services in the last war, Homer enlisted with Bendix at Sidney, N. Y. Farmers with little industry experience, and Swiss and Dutch with little English, were hard to train. Shown scale models of machinery and other equipment, they learned fast. Homer's idea worked.

But he envisioned far bigger opportunities in helping manufacturers cut costs by using models. After the war he worked out details, developed a template layout method to cut drafting time. Then he started his own firm, Visual Planning Equipment Co., Inc. His clients read like a Who's Who of Industry.

A sailor at heart, Homer yearns for the sea. He's a member of the Coast Guard, keeps a small cruiser ready on the river. He paints in water and oils.

this is a bull nut
(as any refinery man knows)



and these are **APEX**
Bull Nut Drivers

(that save time and money
in many refineries)



Setting and removing bull nuts on preheaters of cracking unit furnaces used to be quite a task. It was, in fact, one of the most persistent and troublesome problems of refinery maintenance.

Not any more. This new series of Apex drivers solved that problem. They can be used with almost any make of power tool, and are available in a full range of lengths and hex sizes to accommodate all standard bull nuts.

They are considerably lighter than the tools formerly used for this type of work, yet they will provide longer service life. Can't tell yet how much longer—the first ones ever built are still in service!

Unless you operate an oil refinery, you probably aren't interested in Apex bull nut drivers. But if you have anything at all to do with nutsetting operations, you'll be very much interested in the many other types of Apex drivers.

Whatever your nutsetting problem, chances are you'll find the answer to it among the thousands of stock types and sizes of Apex sockets, exten-

sions, adapters and universal wrenches. And, if your problem should be very special, just send us a sketch or blueprint and we'll most likely come up with the special solution—just as we did for the oil refineries.

CATALOG 29 is packed with specifications, illustrations and helpful information on the complete Apex line—write, on your company letterhead please, for your copy.



sockets, extensions, adapters

THE APEX MACHINE & TOOL COMPANY

1029 S. Patterson Blvd., Dayton 2, Ohio

POWER BITS, INSERT BITS AND BIT HOLDERS, FOR PHILLIPS, FREARSON (Reed & Prince), SLOTTED, CLUTCH HEAD and SOCKET HEAD SCREWS • HAND DRIVERS FOR PHILLIPS, FREARSON AND CLUTCH HEAD SCREWS • TWO-PIECE DRIVERS FOR HEX HEAD SCREWS • SOCKETS, EXTENSIONS, ADAPTERS AND NUT SETTERS • UNIVERSAL SOCKETS, EXTENSION WRENCHES AND ADAPTERS • AIRCRAFT AND INDUSTRIAL UNIVERSAL JOINTS • SELF-RELEASING AND ADJUSTABLE STUD SETTERS • SAFETY FRICTION TAPPING CHUCKS • VERTICAL FLOAT TAPPING CHUCKS.

The Iron Age

INTRODUCES

Harlow H. Curtice, appointed acting president, GENERAL MOTORS CORP., New York.

Michael Pinto, named president, PIONEER ENGINEERING & MFG. CO., INC., Detroit; and L. A. Curnoe, named secretary-treasurer.

J. S. Roscoe, appointed executive vice-president in charge of business administration, THE LINCOLN ELECTRIC CO., Cleveland.

Edgar Schmued, appointed vice-president in charge of engineering NORTHROP AIRCRAFT, INC., Hawthorne, Calif.

E. U. Berthelsen, and K. C. McKay, appointed assistants to the vice-president and manager, Shakeproof Div., ILLINOIS TOOL WORKS, Elgin, Ill. plant.

George O. Shutzbaugh, joins Research & Development staff as associate director of Armed Services Research & Development projects, ALLOY ENGINEERING & CASTING CO., Champaign, Ill.

J. Burton Ayers, elected a director, PITTSBURGH COKE & CHEMICAL CO.

Harry T. Milner, appointed director of personnel, THE NATIONAL ROLL & FOUNDRY CO.

Robert Rasmussen, appointed controller, Toledo plants, DOEHLER-JARVIS CORP.

F. P. Strieter, named assistant superintendent, Die Casting Dept., THE DOW CHEMICAL CO., Midland, Mich.

Claude M. Sheridan, appointed development engineer, THE MIDVALE CO., Nicetown, Philadelphia.

R. A. Hamilton, becomes consulting engineer, Optical Tooling Div., FAR-RAND OPTICAL CO., INC., New York.

Adam Zandel, named executive engineer in charge of Administration of the Engineering Dept., LOEWY CONSTRUCTION CO., INC., subsidiary of Hydopress, Inc.

Richard F. Thuma, appointed superintendent, tools and maintenance section, West Allis Works, ALLIS-CHALMERS MFG. CO.

J. F. Haseman, joins Research and Development staff, FOOTE MINERAL CO., Philadelphia.

B. L. Owens, appointed manager of industrial and mill sales, ATKINS SAW DIV., Borg-Warner Corp., Indianapolis.

James B. Black, Jr., promoted to manager—Bar and Semi-Finished Products Sales, U. S. STEEL, and Shane Lloyd-Butler, promoted to manager—Plate and Structural Products Sales.

Harry I. Hansen, appointed manager, Detroit district sales office, Electrochemicals Dept., E. I. Du PONT De NEMOURS & CO. INC.

Michael F. Ryan, appointed production manager, THE YALE & TOWNE MFG. CO., Philadelphia plant.

F. J. Meyer, appointed division manager, Heating Device Sales, CUTLER-HAMMER INC., Milwaukee.

W. E. Hess, appointed manager of coal mines, JONES & LAUGHLIN STEEL CORP.

David D. Wallace, appointed manager of operations in London for CLEARING MACHINE CORP.

E. L. Carlotta, named manager of all rubber research and development, THE PARKER APPLIANCE CO., Cleveland; and Frank A. Depatie, named manager of rubber sales.



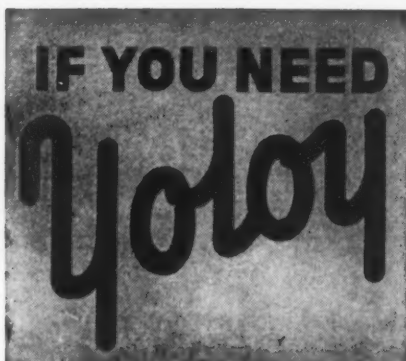
JOHN U. ANDERSON, elected vice-president, Finance, Pittsburgh Steel Co., Pittsburgh.



DWIGHT S. EWALT, elected vice-president and general manager, Rust Furnace Co., Pittsburgh.



JOHN D. POTTER, appointed treasurer, Columbia-Geneva Steel Div., U. S. Steel.



rely on **VIKING**

**complete stocks of
YOLOY PLATE, BAR
SIZE ANGLES, HOT
ROLLED SHEETS 10
TO 14 GAGE INCLU-
SIVE. COLD ROLLED
SHEETS 16 TO 22
GAGE INCLUSIVE.**

- COLD FINISHED BARS
- ALLOY COLD FINISHED BARS
- HOT ROLLED BARS
- STRUCTURALS
- HOT ROLLED PLATES
- ABRASION RESISTING PLATE
- HOT ROLLED AND COLD ROLLED SHEETS
- HOT ROLLED STRIP
- DEFORMED REINFORCING BARS
- YOLOY PRODUCTS
- SOFT BLACK ANNEALED WIRE
- BRIGHT BASIC WIRE AND WIRE RODS
- WIRE ROPE AND FITTINGS
- WELDED WIRE MESH



Personnel

Continued

Albert L. Hunt, appointed manager of industrial sales, National Bearing Div., AMERICAN BRAKE SHOE CO.

Paul B. Wishart, appointed general manager, MINNEAPOLIS-HONEYWELL REGULATOR CO., Minneapolis.

C. W. Heppenstall, appointed manager, forging operations, Newark, Ohio, KAISER ALUMINUM & CHEMICAL CORP.

Fred Rahe, promoted to assistant manager of fleet sales, New York TRAILMOBILE INC.

A. P. Ferguson and E. L. Potter, appointed assistant managers of sales, HOUDAILLE-HERSHEY CORP., Detroit.

Robert W. Hardie, appointed Kansas City district sales manager, ACME STEEL CO., Acme Steel Products Div.

Paul Porterfield, appointed general manager, THE METHOD X CO., an affiliate of Firth Sterling Inc.

Parker W. MacCarthy, made manager of jet engine section, Appliance Div. plant, WESTINGHOUSE ELECTRIC CORP., Columbus, Ohio.

Donald M. Hesling, promoted to manager of manufacturing and engineering SEALED POWER CORP., Muskegon, Mich.

F. H. Catterson, appointed to newly created position of assistant general production manager, Amino Products Div., INTERNATIONAL MINERALS & CHEMICAL CORP., Chicago.

James S. McCullough, appointed sales promotion manager, Industrial Div., GOULD-NATIONAL BATTERIES, INC., Trenton, N. J.

Justus U. Belville, becomes staff assistant to the manager of Alkali Specialty Sales, Cleveland, DIAMOND ALKALI CO.; and Kemble S. Lewis, becomes assistant manager, Chicago branch sales.

A. H. Dean, appointed sales manager, Specialty Products Div., REICHOLD CHEMICALS, INC., and Donald G. Patterson, named technical assistant on resins and plastics to the chairman of the board.

Willard M. Brown, appointed Philadelphia district manager, CHASE BRASS & COPPER CO. INC., Waterbury, Conn.



G. W. STAMM, appointed assistant to the vice-president in charge of sales, Crucible Steel Co. of America, Pittsburgh.



JOHN F. O'CONNELL, appointed a vice-president, Bechtel Corp., San Francisco.



JACK A. CARPENTER, appointed director of industrial relations, The American Welding & Mfg. Co., Warren, Ohio.



ALVIN R. ALMQUIST, named divisional comptroller, Tube Reducing Corp., Wallington, N. J.

Fast,

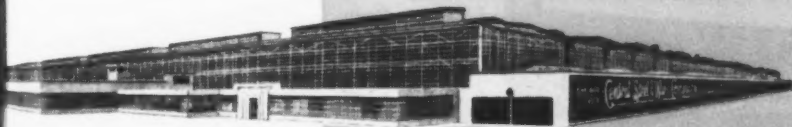
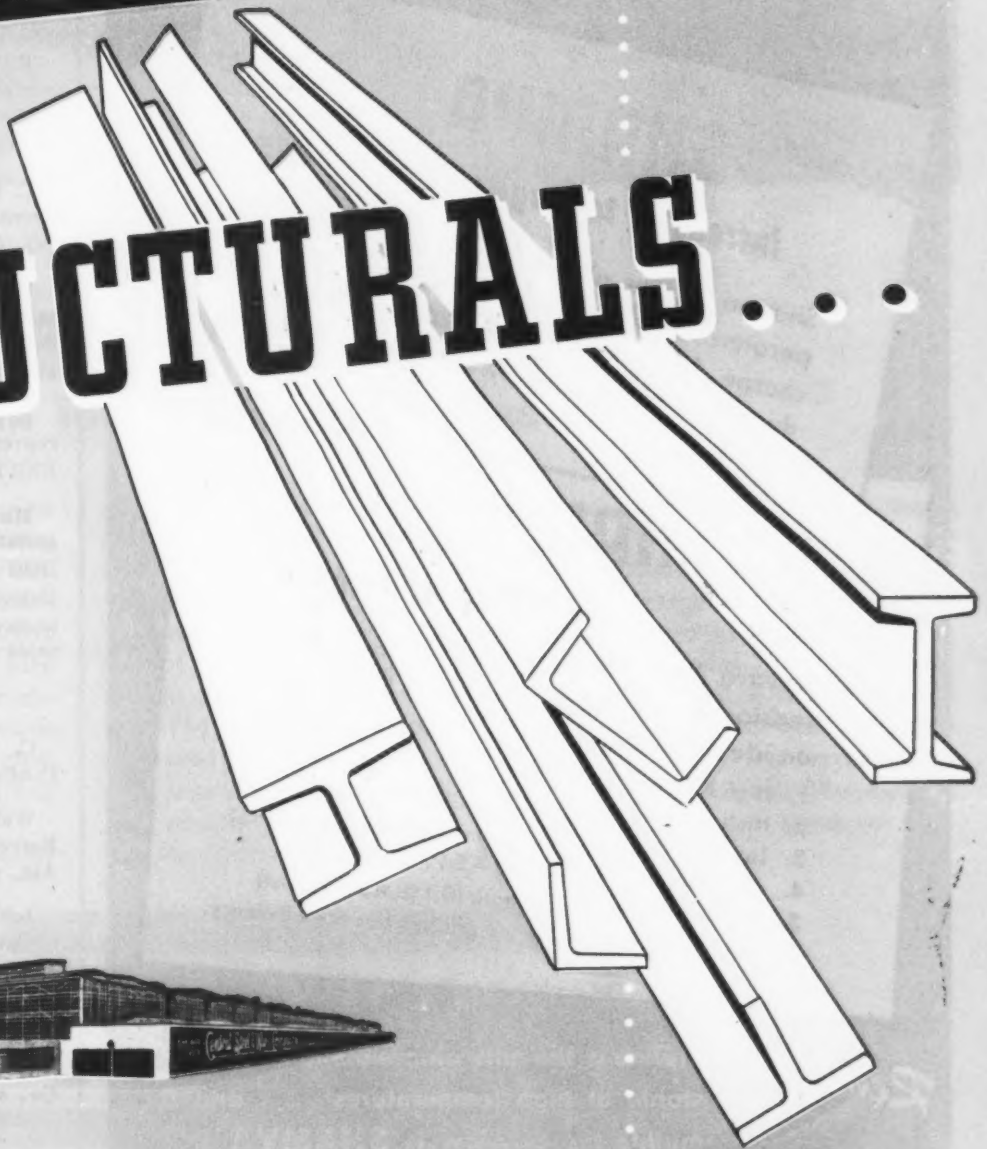
Accurate

CUT-TO-ORDER

Service



STRUCTURALS . . .



Hot Rolled • Cold Finished
Carbon & Alloy • Stainless
Copper • Brass • Aluminum
Expanded Metal • Structurals

Central Steel & Wire Company

CHICAGO 80, ILL.
P. O. Box 5310-A
REpublic 7-3000

DETROIT 12, MICH.
13400 Mt. Elliott Ave.
Twinbrook 2-3200

CINCINNATI 14, OHIO
Box 148 Annex Sta.
AVen 2230

MILWAUKEE 14, WIS.
6623 W. Mitchell St.
EVergreen 4-7400

SHAMVA®

MULLITE BRICK

BOOSTS PRODUCTION

Because **SHAMVA**

increases tonnage per campaign

Shamva Mullite allows higher operating temperatures and quicker heat delivery to the charge. Shortened heat time and low heat conductivity result in more tonnage per campaign.

Because **SHAMVA**

reduces shutdowns

Shamva Mullite Brick have a greater wear resistance and longer service life because of an ideal combination of physical properties.

1. High Fusion Point (3335°F.)
2. High Softening Point (Over 3000°F.)
3. Low Coefficient of Expansion (3.66×10^{-6} per °C.)
4. Anti-Spalling (No spalling A.S.T.M. test)
5. High Load Bearing Strength (0.1% A.S.T.M. test)
6. Low Heat Conductivity for greater furnace efficiency.

Remember

Mullite is the only alumina-silica refractory stable at high temperatures . . . and for mullite the buy-law is **SHAMVA**

THE MULLITE REFRACTORIES CO.

SHELTON, CONN.

Personnel

Continued

Philip H. Threshie, Jr., appointed field engineer, Pacific Coast district, NORTON CO.

R. J. Pitzen, promoted to assistant manager, Sales Training Div. CAT-ERPILLAR TRACTOR CO., Peoria, Ill.

Robert J. Ritchey, appointed assistant general sales manager TOWNSEND CO., New Brighton, Pa.; and David V. Johnson, appointed assistant to the general sales manager also.

A. A. Anderson, appointed division sales manager, Casper, Wyoming, THE NATIONAL SUPPLY CO.

F. U. Naughton, Jr., named manager of railroad sales, HYATT BEARINGS DIV., General Motors Corp., Harrison, N. J.

C. F. Yoders, appointed purchasing agent, PITTSBURGH FORGINGS CO., Coraopolis, Pa.

Herbert T. Andrew, appointed a salesman, Detroit Territory, STANDARD PRESSED STEEL CO., Jenkintown, Pa.

J. P. Friel, appointed eastern sales representative. CLAYTON & LAMBERT MFG. CO.

Murray C. Nelson, promoted to associates' regional manager, BULL-DOG ELECTRIC PRODUCTS CO., Detroit; and Howard D. Ogden, named administrative assistant to the sales manager.

OBITUARIES

C. H. Sayre, president, Trayer Products, Inc., Elmira, N. Y., recently.

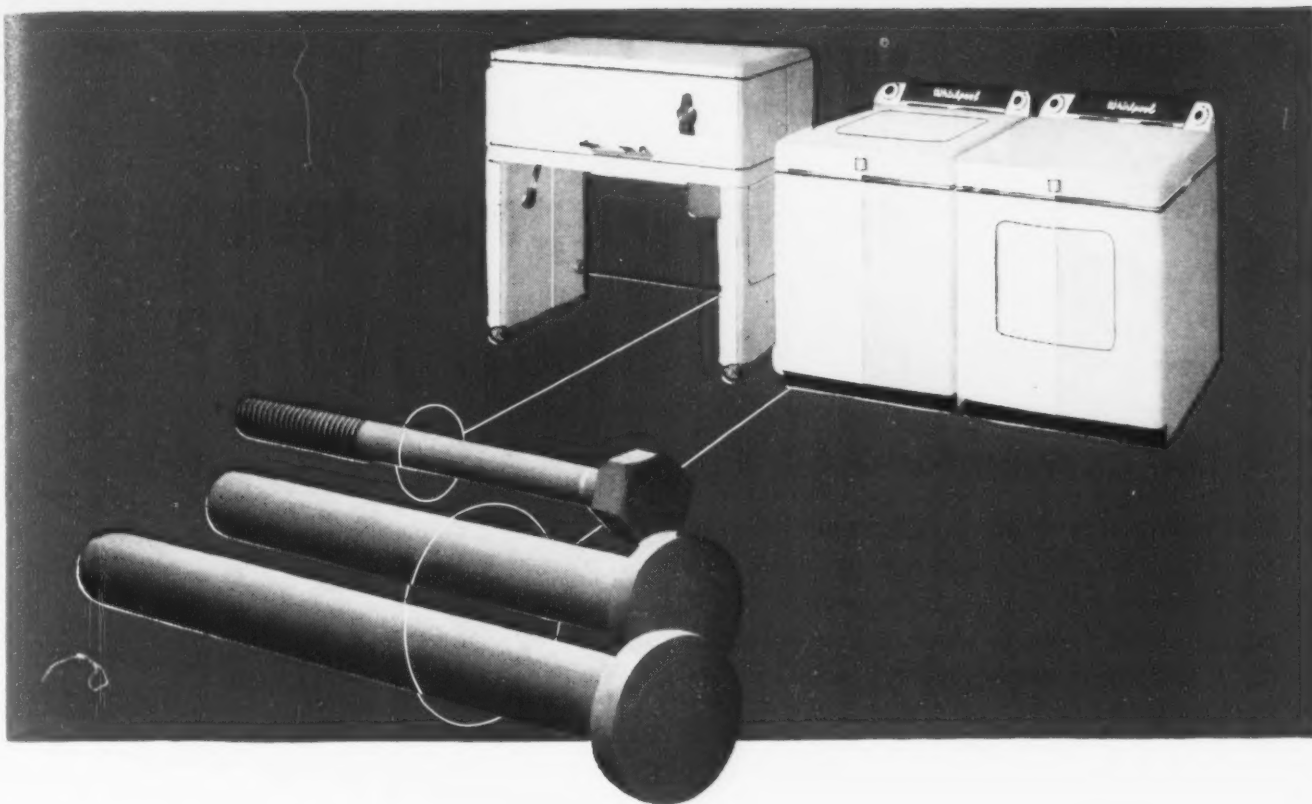
Walter S. Buck, president, Fairfield Barrel Co., at his home in Fairfield, Ala., recently.

John A. Ingwersen, 54, vice-president in charge of distribution, Armco Steel Corp., at his home in Middletown, Ohio.

James Leonard Young, 68, vice-president-Works, Schaefer Equipment Co., at his home in Warren, Ohio, recently.

Frank Faucett, 80, assistant manager, Purchasing Dept., Plume & Atwood Mfg. Co., Waterbury, Conn., after a brief illness.

Carl F. Unruh, 60, director of purchasing, Ford Motor Co., at his home in Farmington, Mich., recently.



Whirlpool Saves \$11,190 In One Year

With Townsend Cold-Headed Parts

In their constant effort to improve Whirlpool home laundry equipment without increasing costs, the Whirlpool Corporation last year submitted the three special parts shown above to Townsend. Two of them are used to support and align the entire mechanism in the Whirlpool Automatic Washer. The other is used as a pressure spring adjustment on the shoe of the Whirlpool Ironer.

By applying more than a century

of cold-heading experience to the problem, Townsend was able to produce better parts at savings ranging from \$7.00 to \$20.00 per thousand. The total savings on a year's production of thousands of washers and ironers amounted to the substantial sum of \$11,190 under the cost of the parts used previously.

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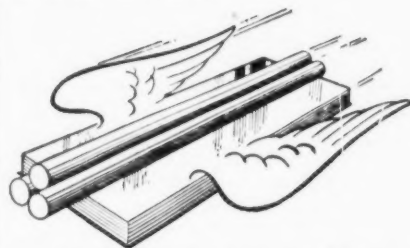
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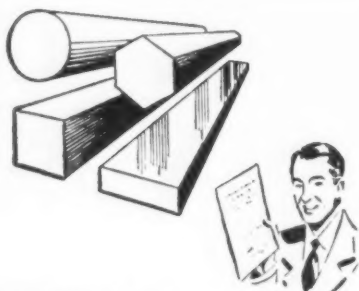
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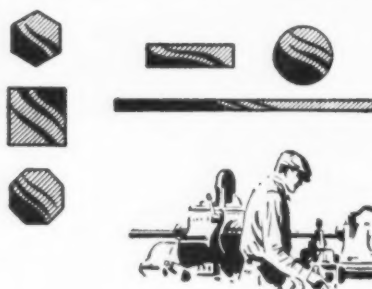
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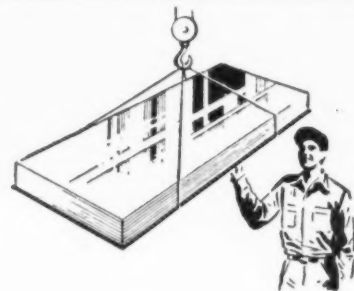
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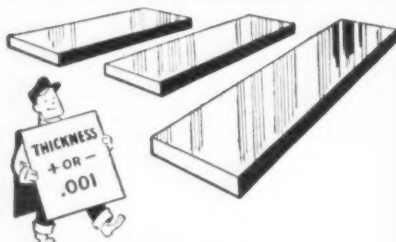
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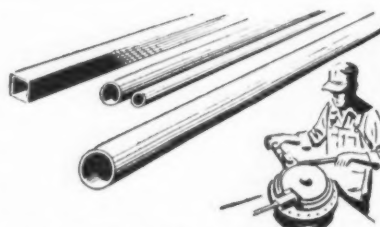
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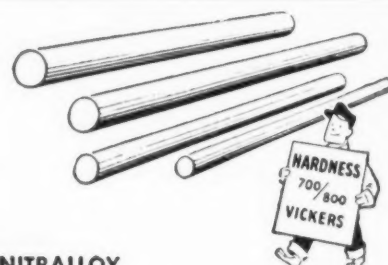
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CONVEYERIZED iron ore dock capable of unloading 3000 tons of various types of ore per hr.

BELT CONVEYERS, Arteries of New Ore Dock

Increased imports of foreign ore necessitated expansion of the Baltimore pier of Canton Co. By installing another crane and handling all ore via conveyer, this dock can now handle 3000 tons of ore per hr. Using three loading tracks 19.2 cars per hr are loaded. Weighing is automatic and the bins and feeders can be quickly adjusted to efficiently handle different types of ore and all types of ore carrying cars.

♦ JUTTING SOUTHWARD into the Patapsco River and forming part of the great port of Baltimore is the ore unloading dock of the Canton Company. For years the two unloading towers on this dock have been transferring various ores from vessels flying the flags of many nations. Several years ago the company, realizing that the demand for foreign ores is ever increasing, decided to expand their facilities. To determine the best means of accomplishing this and to design and build the necessary improvements, they engaged the services of Robins Engineers, a Division of Hewitt-Robins Incorporated.

By W. H. Raff
Contract Engineer
Robins Engineers Div.
Hewitt-Robins Inc.
Stamford, Conn.



With only two cranes operating, delay in loading cars was experienced because of the lack of sufficient tail room for the ore trains. This was particularly noticeable when unloading a ship berthed at the south end. Therefore a third crane was added at the offshore end of the dock, new weighing and car loading facilities were provided inshore. Alterations were also made to the two original cranes so that ore from each of them might be conveyed to the new weigh station.

The dock was widened along its 800 ft east face and a new 48 in. high line conveyer installed along the entire east side. To preclude

"The cranes, under ideal conditions . . . have each handled better than 900 long tons per hr . . ."

wear and tear on expensive belts, a short, rugged transfer conveyor was mounted on the crane, directly over and in line with the high line conveyor. This transfer conveyor, not only takes the pounding of the heavy ore, but also eases the ore quietly onto the high line belt in the direction of its travel and close to its speed. This short belt, having little tension, is inexpensive and can easily be replaced.

The cranes, under ideal conditions of free digging and heavy ore have each handled better than 900 long tons per hr. As a safety factor, all new conveying equipment on each crane is designed to handle 1200 long tons per hr. It is not practical to expect all three cranes to be operating simultaneously at maximum capacity. The high line and slope conveyers are therefore designed to handle 3000 long tons per hr.

The 48 in. high line conveyor is 1336 ft long. The belt for this conveyor is a Maltese Cross belt with seven plies of 42 oz long staple cotton

duck with the two bottom plies nylon filled. The top cover is $\frac{3}{8}$ in. thick, including two bias laid cord breakers next to the carcass. The bottom cover is $\frac{1}{16}$ in. thick. The belt is field vulcanized to be endless.

Steel troughing idlers are used throughout. Because of the abrasiveness of the ore, the return idlers which come in contact with the carrying side of the belt are of the rubber disc type. A liberal number of training idlers are provided for the return belt. Heavy cast iron pulleys are used with extra heavy habbitted pillow blocks.

The drive pulley has its $7\frac{1}{2}$ in. diam shaft direct connected by double engagement gear type flexible couplings to a heavy duty roller bearing herringbone speed reducer driven by a 250 hp wound, rotor motor. This 870 rpm motor drives the belt at a speed of 545 fpm.

A vertical gravity take-up is located in back of the drive and inside the Junction House to provide for operating changes in belt length. An additional screw take-up at the tail end allows for permanent belt stretch.

The 48 in. slope conveyor receives ore from the high line at the Junction House, skews to the west and runs upward at an incline of 16°



MAIN LINE BELT runs along the Canton Railroad Pier and handles output of three cranes.

over the tracks to the surge bin in the weigh station. It is 275 ft long with a lift of 75 ft. This cross belt is of the same specifications as that for the high line except that it has nine plies instead of seven.

The belt is driven by a heavy cast pulley mounted on an 8 in. diam shaft. Both ends of this shaft are direct connected through flexible couplings to speed reducers, each of which is driven by a 200 hp wound rotor motor. The belt speed is 615 fpm. A heavy roller holdback is keyed to the drive pulley shaft to prevent run-back under load in case of power failure.

The weigh station is in many respects the heart of the plant. In general, it consists of a bifurcated surge bin, each leg of which discharges to two feeders. These feeders service four weigh hoppers mounted one over each track. The capacity of the surge bin varies from 600 long tons to 1800 long tons, depending on the weight of the ore and its angle of repose. With 150 lb ore, it will hold about 1200 long tons, sufficient for 24 min supply with all three cranes operating at maximum rate. Electrically operated swinging gates permit diverting all of the ore to either side of the bin. This arrangement of gates and feeders permits unusual flexibility in loading cars as all four tracks can be

ORE LOADING CYCLE

Start feeder	2 sec
Run feeder	50 sec
Stop feeder plus time delay	10 sec
Weigh loaded hopper incl. printing	5 sec
Open gate	5 sec
Empty hopper	8 sec
Close gate	5 sec
Weigh empty hopper incl. printing	5 sec
Total cycle	90 sec

loaded simultaneously or any combination of tracks can be loaded.

Another exceptional feature is the inclusion of two cleaning scaffolds. Each of these is suspended in the light of a steel cable in such a way that when idle it will clear the pile, but when used for cleaning, it can be both lowered and moved sidewise to give access to all of the interior surfaces of the bin. One ship may carry ore of a sticky nature which will hang up on the bin walls, while the next ship may have an entirely different ore destined to another consignee.

Each of the four feeders is 72 in. wide with a



WEIGH STATION in background receives all ore from the main line belt.

"Expansion of the dock introduced major electrical problems . . . All equipment, except weightometer and lighting, operates on 550 v dc . . ."

capacity of 2500 long tons per hr. The drive sprockets are direct-connected to speed reducers with "V" belt drives between the high speed shafts of the reducers and the 25 hp motors.

The weigh baskets and scales are of exceptional interest. In a privately owned ore dock such as this, ore cars of many types and capacities are encountered. They will vary from 50 ton cars with a load limit of 120,000 to 128,000 lb to 90 ton cars with a load limit of about 210,000 lb. They may be bottom dump, side dump or gondola. With this wide diversity, and bearing in mind that gondolas must be dump loaded over the trucks, it was decided to use a single dump system. Investigation at other ore docks disclosed that the average load per car over a year ran around 65 long tons, or 146,000 lb. Allowing a slight margin of safety, an average car load of 140,000 lb was chosen.

It is desirable to have the loading capacity at each track able to handle any one crane. With all three cranes operating and the conveyer system carrying 3000 long tons per hr, three tracks are to be loading with the fourth for switching. Here again, a margin of safety was provided by establishing the loading rate at 1200 long tons per hr.

With these two factors established, it was possible to develop the cycle at the weigh hoppers. On the basis of loading out 1200 long tons

per hr into cars at 140,000 lb per car 19.2 cars are loaded per hr. This rate demands 38.4 dumps per hr or one dump in 90 sec. From this the scale cycle shown in the table was arranged.

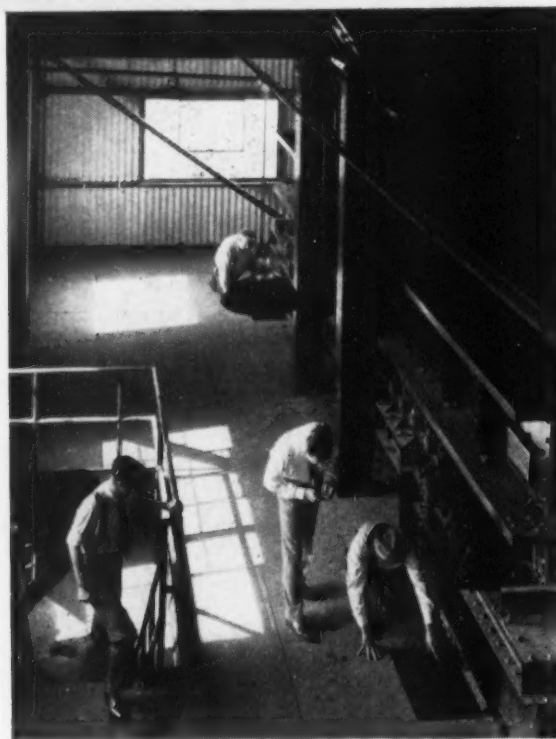
The expansion of the dock introduced major electrical problems. A complete power analysis indicated that a series of electrical changes would be required until the entire dock ultimately would be serviced by 60 cycle. The first step was the purchase of a complete steel clad, centrally located, substation to receive primary power from two underground incoming cables. The power then passes through high voltage circuit breakers, a metering panel, a future take-off panel, a 750 kw transformer, and finally through 440-v, secondary air circuit breakers for distribution to the system. The take-off panel following the metering panel permits the installation of future dc conversion equipment with the minimum cost.

All equipment, except the weightometer and the lighting in the weigh house operates on 550 v dc. The weightometer and fluorescent lighting operates on 110 v, 60 cycle, supplied by a small converter on this crane.

The high line and slope conveyers, as well as all electrical equipment in the weigh master's house will operate on 440 v, 60 cycle current. The general lighting and power for small tools, heaters, etc., is obtained from small transformers.



UPHILL CONVEYER carries ore to weigh stations prior to loading in railroad cars.



LARGE STORAGE HOPPER at weigh station will hold about 1200 tons and distributes ore to separate feeders.

Stretch forming machine SHAPES EXTRUDED ALUMINUM PARTS

A 60-ton capacity Model A 12 Hufford stretch forming machine is being used at Consolidated Vultee Aircraft Corp.'s San Diego plant to form the contour in aluminum alloy aircraft components. Materials are ordinarily stretched within a range of 1.5 to 3.0 pct. On channels with legs out, a flexible mandril is used to prevent collapsing. Machine also eliminates routing, blanking or sawing operations on flat sheared stock.

◆ **STRETCH FORMING** differs from punch press or other types of die presses in that on the stretch press the material is clamped or gripped on both ends and stretched over a form until the elastic limit of the material is reached. Excessive springback is eliminated and the material is set to the contour of form. Stretch forming slightly reduces material thickness by a few thousandths. However, the increase in tensile strength through stretching more than compensates for the loss in section. A water soluble lubricant is used between the material and form.

The Hufford Stretch Forming Machine was developed in an effort to eliminate hand forming of regularly contoured parts. Early stretch forming methods included clamping the ends of the part to mechanical jacks which were actuated to stretch the material. Later, hydraulic jacks were used to push the form block against the material. These inefficient methods lead to the development of modern stretch forming machines.

Present equipment is hydraulically powered using quick action hydraulic collets. Actuating arms are controlled by power driven worm gears. The travel is regulated by mechanical stops controlled from a centrally operated control panel. Under earlier methods, parts had to be preformed prior to stretch forming. Present machines perform the

"When extrusion parts are stretched the radii of the form blocks must be held at very close tolerances to extrusion specifications."

wrapping operation in conjunction with stretch forming, thereby eliminating double handling.

Stretch forms are made from tooling templates usually by routing to the outside perimeter. In stretching material on the Hufford 60 ton machine severe contours slightly reduce the outstanding flanges. This material loss is compensated for in developing the detail template. Allowance for springback need not be made in the stretch form blocks when stretching aluminum alloys but are usually included for stainless steel, titanium or other similar metals.

Adhesive tape in form blocks

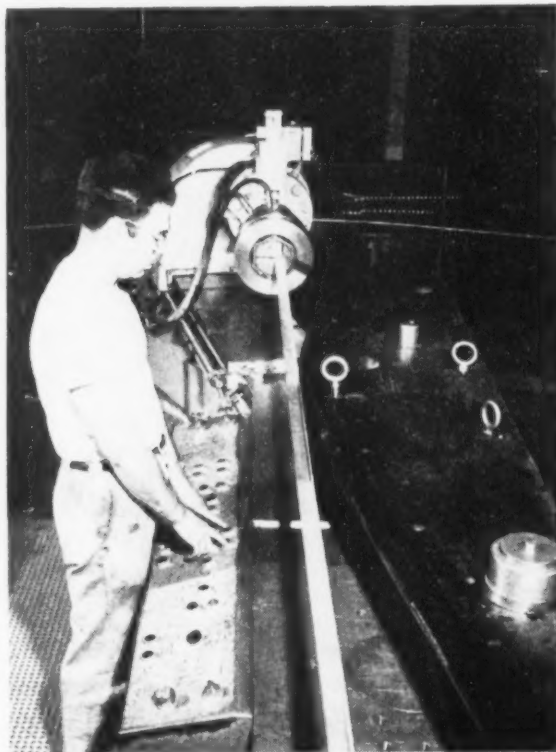
When extruded parts are stretched the radii of the form blocks must be held at very close tolerances to extrusion specifications. In practice radii of extrusions from different sources vary. Use of commercial adhesive tape on the form blocks will usually overcome these slight differences and eliminate the necessity for reworking the form. To secure the form block to the table of the machine two holes are put in the form block coordinating with tooling posts on the table. After the stretch form is secured in place, jaws are selected according to the section of the material being formed. These are installed in the collets of the actuating cylinders.

Where the contour is severe, the material is preformed in an SO condition. The SO parts are then heat treated and finish formed in an SW or ST condition. Where contours are not severe parts are formed in the SW or ST condition. When forming is completed, the part is removed from the machine and checked for contour against a Checking Template. Materials ordinarily are stretched within a range of 1.5 to 3.0 pct. On channels with legs out, a flexible mandril is used to prevent collapsing. In forming "L" angles with open degrees, a backing plate clamped over the horizontal flange is used to prevent crawling of the material.

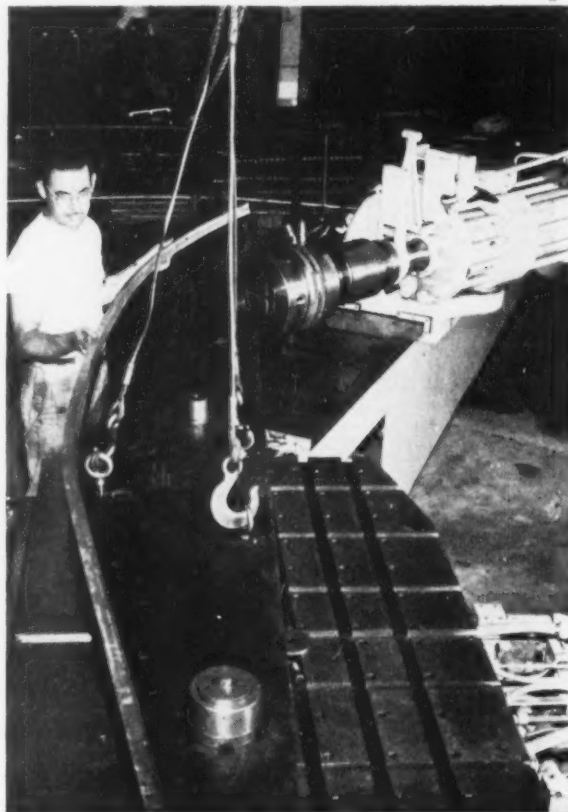
Eliminates several operations

The Hufford stretch forming machine also eliminates routing, blanking or sawing operations on flat stock. Flat sheared stock may be contoured on edge in units of four to six pieces to any reasonable shape. This eliminates high tooling costs and conserves considerable material. The use of clamps while stretch forming is a valuable adjunct in maintaining proper contour. On heavy materials a pneumatic hammer is used to help work the material to the shape.

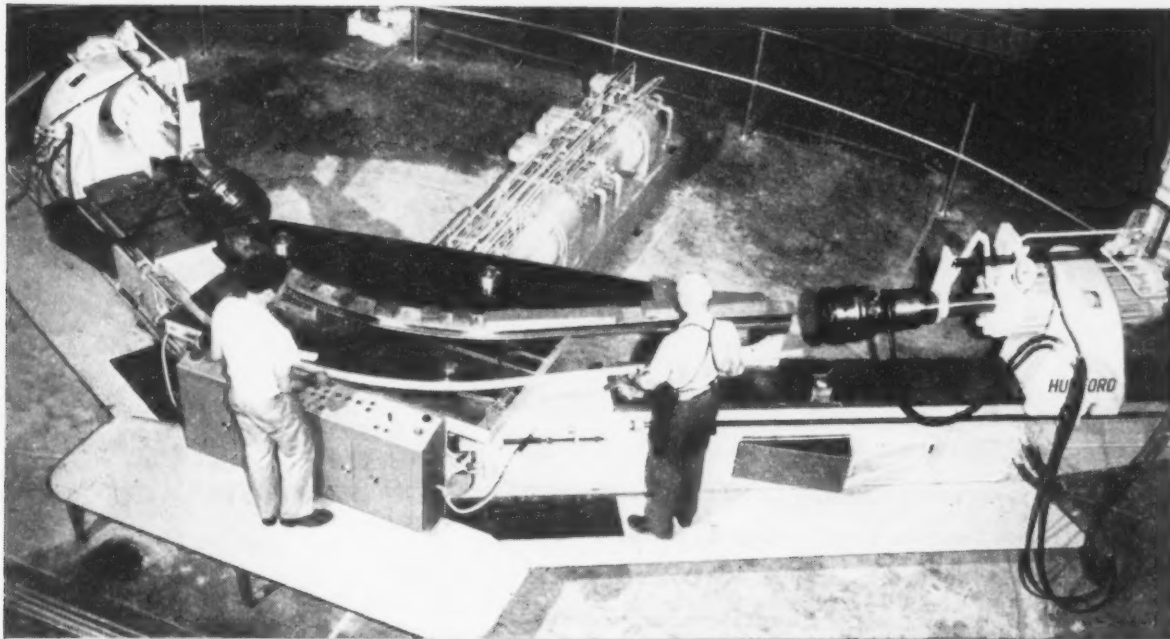
Reverse contours may be formed by applying forms on the back side of a part, by applying pressure with auxiliary equipment or by clamping. Jogging can be accomplished by applying pressure with auxiliary hydraulic equipment.



T-SHAPED aluminum alloy component in initial stage ready to be stretched around template.

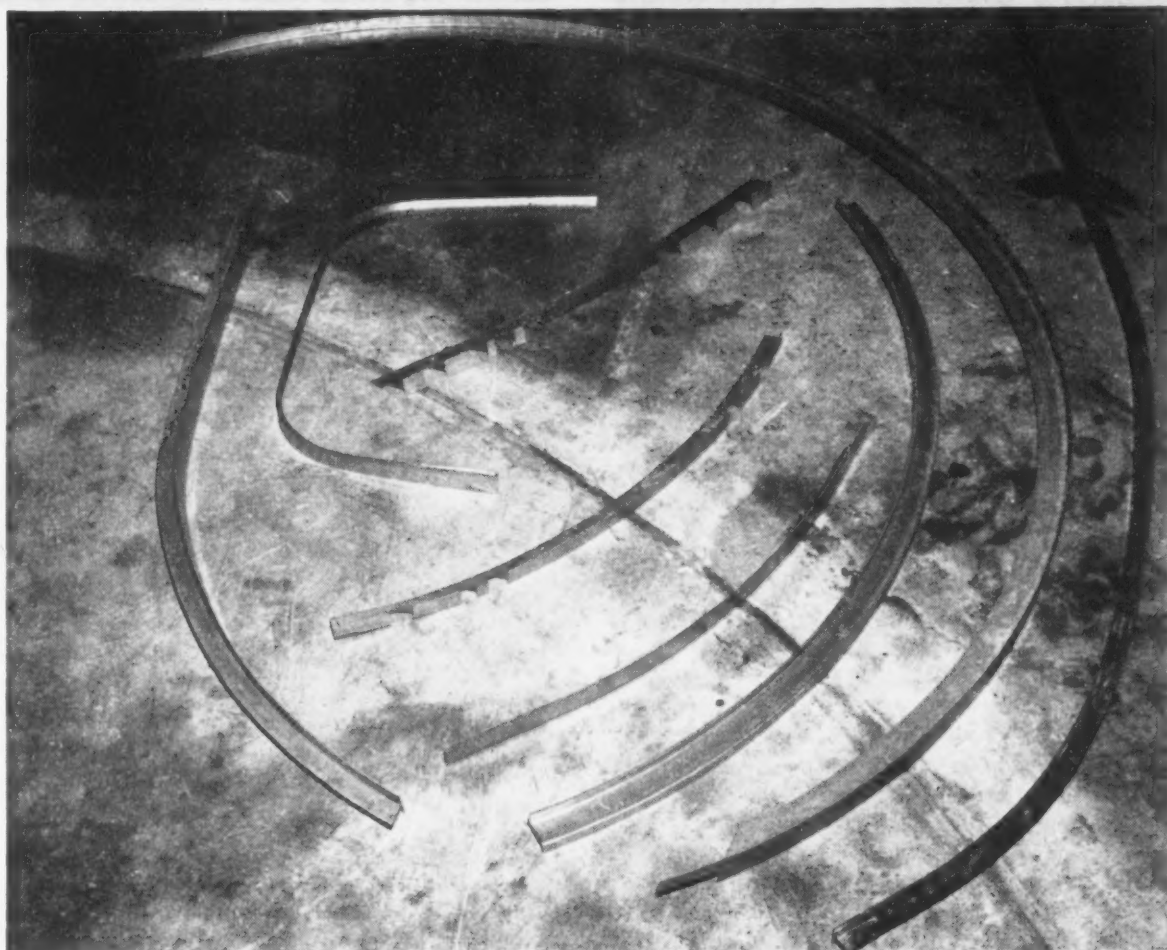


AFTER STRETCHING components are inspected. Cables attached to template show how fixture is removed for resetting of machine for new operation.



REMOVING an extruded aluminum part stretched to shape on a stretch forming machine.

DEGREES of stretch-wrap forming are shown in components below. Parts are used in Navy R3Y seaplane.



Pour it in—

CAST REFRACTORIES

replace brick in heating furnaces

A new cast refractory material has been tested by Oldsmobile Div. Forge Plant at Lansing, as a substitute for all-brick refractory in a barrel-type forging furnace. Separate tests were made on a 3-section barrel furnace as well as a 4-section furnace with automatic loading. While the tests are still incomplete, indications point to (1) comparative freedom from spalling and longer furnace life, (2) a very substantial reduction in maintenance expense when using the new material.

By W. G. Patton
Asst. Technical Editor



◆ NEARLY TEN MONTHS AGO, maintenance engineers at Oldsmobile's Forge Plant began a test of a new cast refractory material. This replacement for all-brick linings previously used was installed in two of their barrel-type forging furnaces.

Purpose of the tests was to observe the service characteristics of cast refractory material, determine its resistance to cracking and spalling and to measure the overall economies that would result from the use of quickly changeable precast sections.

Furnaces selected for the tests were two Surface Combustion barrel-type gas-fired units. Both furnaces are of the fast-heating type which operate at a temperature of 2550° to 2600°F. One of the test furnaces has four cylindrical sections in addition to the flue sections at the heating and discharge ends. Each furnace normally operates on a 16 hr schedule per day for five days each week.

Both are pusher type furnaces. The 4-section furnace, Fig. 1, is equipped with automatic feed which permits the heater to stand at the side of the press operator. The heater picks up a hot billet and places it on the die for the press operator. He then places a cold billet on a gravity conveyer which delivers it to a power conveyer feeding the furnace, shown in Fig. 2. Billets move through the furnace on double, water cooled rails and do not touch the bottom of the furnace. Inside diam of the heating furnace is approx 32 in.

Oldsmobile uses brick construction in the

charge and discharge flue sections of the furnace. Each of the quickly replaceable sections has a brick floor or base. Cast refractory lining is used for the top and side walls.

Experience to date indicates that slag accumulation on the cast linings is not excessive and can be readily chipped off. Chipping on the base of the furnace can be performed in the usual manner. Spalling and cracking, where it has occurred, has been at a minimum and appears not to interfere with long furnace life of the cast refractories.

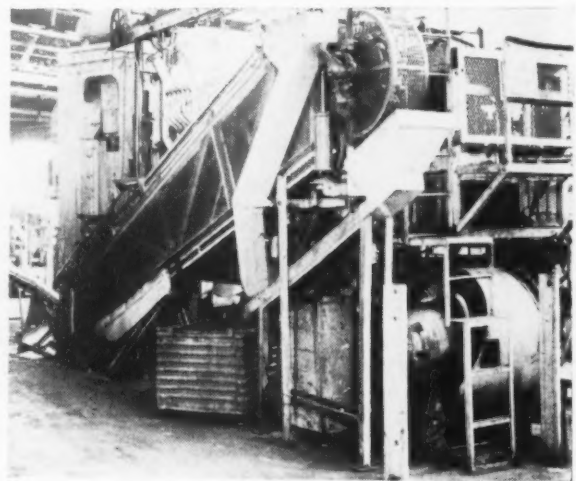


FIG. 1—Cold billets for this barrel-type gas-fired furnace are placed on the gravity conveyer at the lower left and delivered to the power conveyer on the left side of the furnace. Billets go through the furnace on water-cooled rails.

TABLE I

FURNACE LIFE

(Hours)

Type	No. 1	No. 2	No. 3	No. 4
4 zone-cast.....	1050*	1050*	847*	847*
3 zone-cast.....	1300*	1300*	914*	
4 zone-brick.....		760	585	

* Continuing in service.

It is the practice of this plant to change the furnace lining when the lining appears red on the outside of the shell. Linings are also changed when excessive spalling or wear occurs. In the comparison of furnace lining life shown in Table I, Sect. No. 1, is the section adjacent to the charging end of the furnace and sections No. 3 and 4, respectively, are sections adjacent to the discharge end of the furnace. These tests are continuing and visual examination of the cast refractories gives no indication of failure.

It is evident from Table I that the cast lining has already surpassed the life of the previously used brick by more than 50 pct. There are some indications that the final results may show life for the cast lining of at least double the normal life of all-brick lined sections.

Extended life of the furnace lining not only reduces maintenance expense but also permits a substantial increase in output of forgings.

The economic advantages of the cast material as compared to all-brick lining are shown in Table II. The savings per furnace section relined is more than \$500 per section.

Changing a worn or damaged section of this type furnace is simple. After unhooking the burners and the piping, furnace sections may be removed by a lift truck, fork truck or crane, either by raising the section or by moving it sideways. It is not necessary to cool the section to

TABLE II

COST COMPARISON

	All-Brick	Cast
Labor to remove.....	same	same
Labor to rebuild.....	\$192.50	\$ 67.00
Material to rebuild.....	586.78	197.52
Total.....	\$781.28	\$264.52

room temperature before removing it.

Operating practice at Oldsmobile is to keep a spare furnace section lined with cast refractory which is ready to replace any other damaged or worn section of the furnace. Fig. 3 shows one of these spares ready for use.

Liner material is purchased from General Refractories Corp. and Babcock and Wilcox Co. The material is purchased in 100-lb bags dry. After adding a small amount of water, the mix is worked briefly before pouring.

Since burners are already attached to the outer shell, it is necessary to place a plug in each burner hole. After bricking two coarses at the base of the furnace, a thin metal ring having the same height as the furnace ring is placed inside the outer ring. This inner ring is held in position by two circular board forms placed at the top and bottom. Asbestos paper is placed between the outside furnace shell and the cast liner material as a heat barrier and insulator. The mix can be shoveled into the mold in less than $\frac{1}{2}$ hr.

The cast refractory is permitted to dry for 2 days. After removing the forms, a lazy gas flame is applied for approx 72 hr.

In actual operation, these forging furnaces at Oldsmobile are subject to many cycles of heating and cooling. Normally, the furnaces are lighted at 5 a.m. prior to starting operations at 7 a.m.

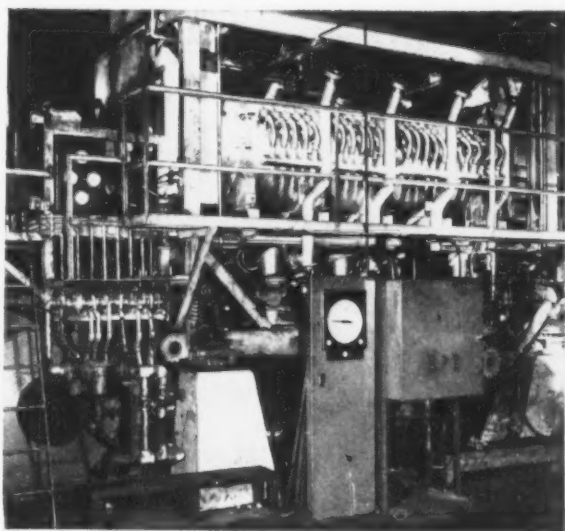


FIG. 2—Cast refractory lining is used for the top and side walls of the four cylindrical sections of this furnace.

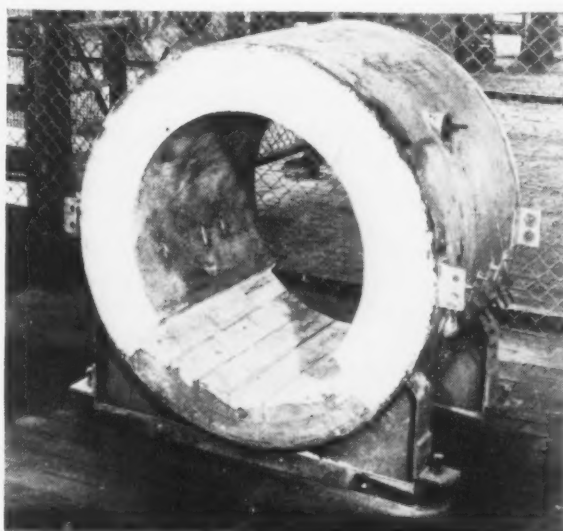


FIG. 3—This spare furnace section lined with cast refractory material is held ready to replace any damaged section.

Down the hatch—

Chip Engineering

VITAL COUNTERPART

♦ WHEN THE DAILY CAPACITY of the Ford-Cleveland engine plant was determined for Ford overhead valve six and Mercury V-8 engines it was recognized that an unprecedented volume of chips would be generated during a 2-shift operation.

Preliminary estimates showed that in machining the block, cylinder head, crankshaft and camshaft, as well as other smaller engine components, approximately 100 lb of chips per engine would have to be handled. More than 40 lb of dry gray iron chips are removed from the six-cylinder Ford block alone.

It was estimated that when capacity operation is reached at Cleveland, the new engine plant will generate more than 230 tons of wet and dry chips per day. Approximately 80 pct of the chips collected are dry. The method employed to solve this problem is described in this article.

Merely collecting, transporting and disposing of 185 tons of dry chips per day—at the right place and at the right time—presents a formidable engineering and materials handling problem. Keeping these chips from fouling up the most completely automatic machining and materials handling operation in the world presents another problem no less difficult than the bulk handling of chips.

Before describing the new Ford-Cleveland chip control plan for dry chips it may be helpful to point out that when transfer machines were first used, it became necessary in many cases to use hollow machine bases so that chips would fall by gravity into chip handling equipment. Chip conveyers are usually located at floor level in machines and below the floor level for cross collection conveyers. Inability to provide adequate chip disposal facilities has sometimes prevented the use of transfer machines where these fast, modern, multi-station machine tools would otherwise be desirable.

At its Cleveland plant, Ford has made use of hollow machine bases and a bulk dry chip handling system that has been used successfully for several years in a few individual machines. This is, however, the first use of this system throughout an entire plant.

At the new engine plant, oscillating conveyers are used exclusively for conveying dry chips. This type of conveyer consists of a (1) horizontal trough or channel for containing chips, (2) upright fibre plates which permit flexing and support the chip trough, and (3) mechanical drive with eccentric crank to impart motion to the chip trough. The vibration created causes chips to move steadily forward until they fall into the main oscillating conveyer which discharges the chips into a hopper located along the broad aisles of the new plant. (Fig. 1.) During capacity operations, it is estimated that each dry chip hopper in the new plant will be emptied once every hour. Fig. 2 shows one of these portable hoppers being loaded by a bucket elevator.

The unobserving visitor to the new Ford engine plant may easily underestimate the amount of engineering that has gone into the Ford chip control system. Many unusual devices have been designed to keep chips from interfering with the continuous operation of the plant. In some instances, these methods used are being introduced for the first time to the automotive industry.

These "tremendous trifles"—entirely automatic in operation—include (1) rubber pads to wipe off locating surfaces, (2) wire brushes to clear chips off moving blocks, (3) automatic washing to remove both chips and grease, (4) use of air jets, (5) special vibrating mechanisms that are built into the machines to dislodge chips that may have accumulated in critical locations.

Chips are a problem in any machine shop. However, where the volume of chips is very large—and parts are transferred and located automatically—improved techniques for emptying conveyers and preventing chips from interfering with the transfer, location or clamping of parts have to be developed. "Chip Engineering" rightfully got a top priority at Ford's new Cleveland engine plant. Ingenious steps taken to remove chips automatically from machines and keep them from interfering with machining operations constitute a new and interesting chapter in high production machining. Application of many of the new methods is not necessarily limited to large plants like the Cleveland engine plant.

TO AUTOMATED MACHINING LINES

With comparatively few machine operators it was essential to provide automatic equipment to perform many of the functions an operator would ordinarily take care of—often with little physical effort. Wiping or brushing off critical locating surfaces is an example.

At several locations in the new Ford automatic transfer line, pieces of rubber are suspended from brackets to wipe off chips and grease from critical surfaces. Such a device is used, for example, to remove chips from the ways of the huge Cincinnati 3-station tunnel type broach shown in Fig. 3.

The use of wire brushes has been restricted to areas where extreme cleanliness is necessary. For example, in the rough, semi-finished and finish boring operations for the camshaft and crankshaft there must be no interference with clamping. As the block moves into the multi-station boring machines, a wire brush removes the chips from the pan rail which is used for locating. In this operation, clamping is from the bottom to the top. Tolerance for the finished operation is 0.0005 in.

Selection of the top for locating was dictated in part by the fact that there would be less likelihood of chips interfering with proper location of the block.

During the machining of the Ford six cylinder, low friction engine, the block is washed three times, in addition to a kerosene flush out. Besides the removal of dirt, sand and grease, pressure washing with a detergent removes chips from areas in which their presence might cause serious damage either to tooling or when the engine is operated.

Operation 185 is a centrifugal type wash, internal flush, rinse and dry-off operation performed in a Centri-Spray washer. The cylinder block is loaded, located and clamped automatically in a cradle type fixture. The block is then ro-

tated while being conveyed through the machine. A special flushing mechanism is used to clean critical internal passages. Automatic block unloading and transfer as well as sludge removal are other features of this machine.

Air jets are used wherever necessary to clear away chips. Examples are tapping operations and broaching. As the block moves forward, it trips a solenoid which actuates an air valve, blowing the locating surfaces clean prior to clamping. It is essential to keep all locating points free of chip accumulations and the air jet



FIG. 1—Dry chips drop from end of oscillating conveyor into skip bucket. Electric eye in lower right mounted on pit wall prevents overloading of bucket.

"In more than 20 major machining and washing operations . . . there is no manual handling . . ."

has proved exceptionally useful in the Ford automatic machining setup. Operation 100 has an automatic air blowout.

Automatic rotation and turnover devices employed at Cleveland are of the latest design. Fig.

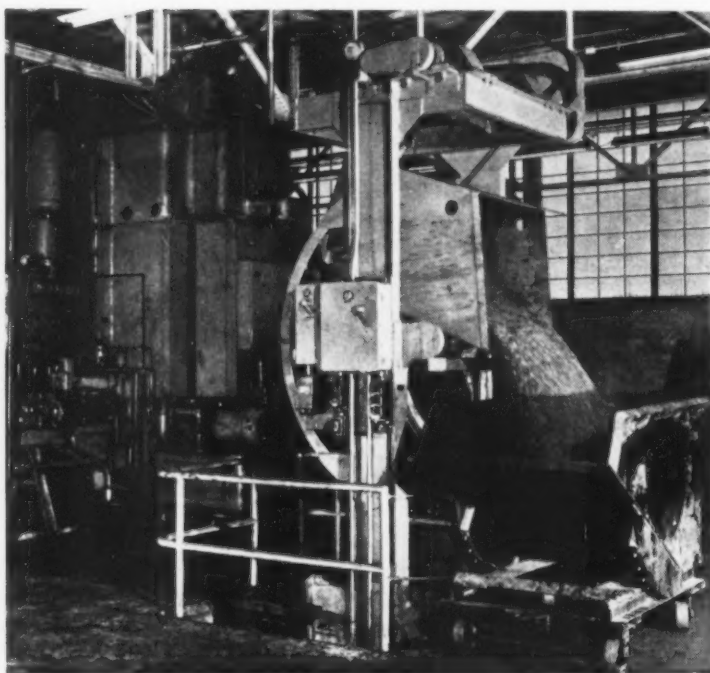


FIG. 2—Bucket elevator shown dumping cast iron chips into portable hopper to be delivered to briquetting operations. This portion of chip removal system serves the cylinder block department.

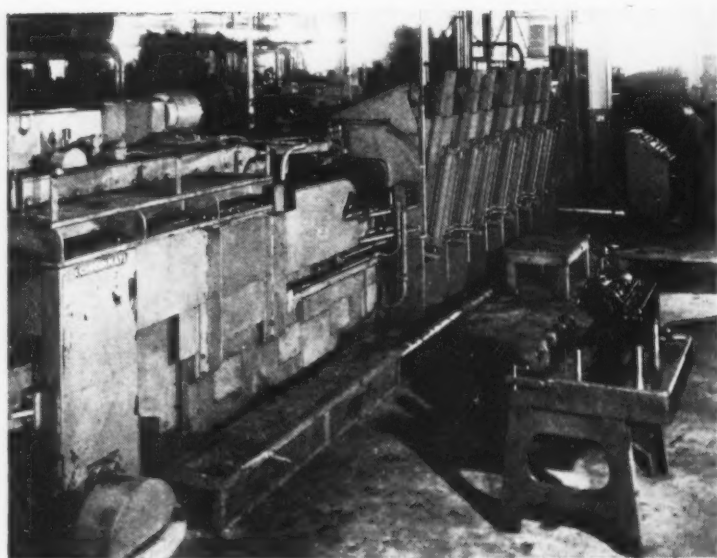


FIG. 3—One man controls this automatic horizontal broaching machine. This 96-ft long machine broaches main bearing journals, main bearing locks and top and bottom faces of the engine blocks.

4 shows one of the most unusual of these rotating machines which is used both to bring the block into position for machining and to remove chips from the inside.

In passing through the complete cycle of operations, a 1952 Ford six cylinder block is automatically rotated or turned more than a dozen times during the machining cycle.

In addition to facilitating transfer and machining operations, automatic chip removal has resulted in increased tool life.

Vibration devices are also employed at several locations to remove chips in the crankshaft and camshaft machining lines.

Arm sweeps chips out

Another interesting device used by Ford at Cleveland is an arm that moves down and sweeps the chips out of an oil gear tunnel broach. During this operation, chips tend to roll off the fixture and accumulate in a location where they might interfere with the operation of the broach. An arm sweeps the chips out. As the block moves forward, the arm returns to its forward position, ready for the next block.

In the Ford-Cleveland block machining line there are more than 20 major machining and washing operations. There is no manual handling of blocks in the line. In the entire system there may be as many as 750 blocks at one time. Storage area for 1000 blocks is provided.

The large broach used in the Cincinnati machine (Fig. 3) contains 1266 carbide tools. Several of the transfer machines have 20 or more stations. To perform all the operations on the Ford and Mercury engines at Cleveland, Ford tooling engineers and their suppliers have designed 8600 different tools, not counting tools requiring several details.

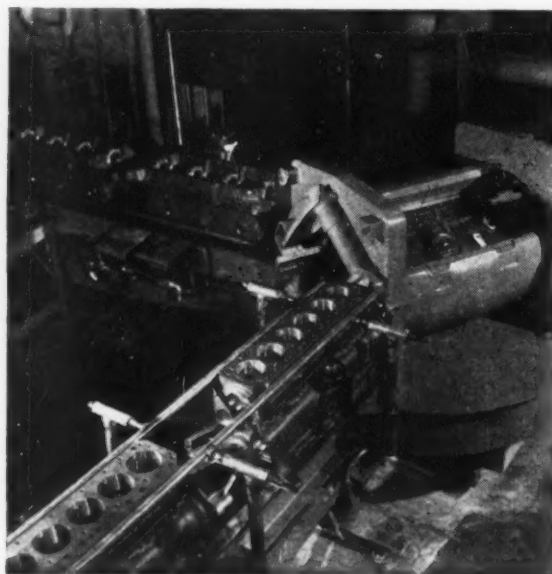


FIG. 4—Two-directional automation device turns blocks end for end and revolves them upside down to facilitate machining operations. The compound motion is fast, shockless and typical of the special devices.

No dip or spray—

Production Costs Lowered With PRE-COATED COIL STOCK

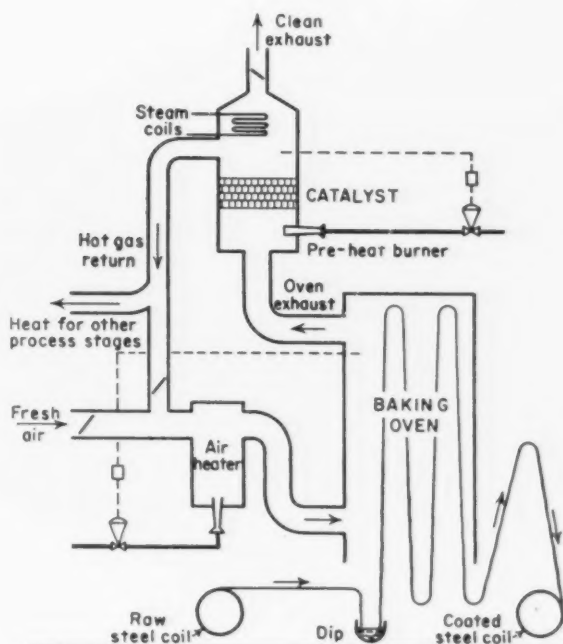


By Arthur E. Uhleen
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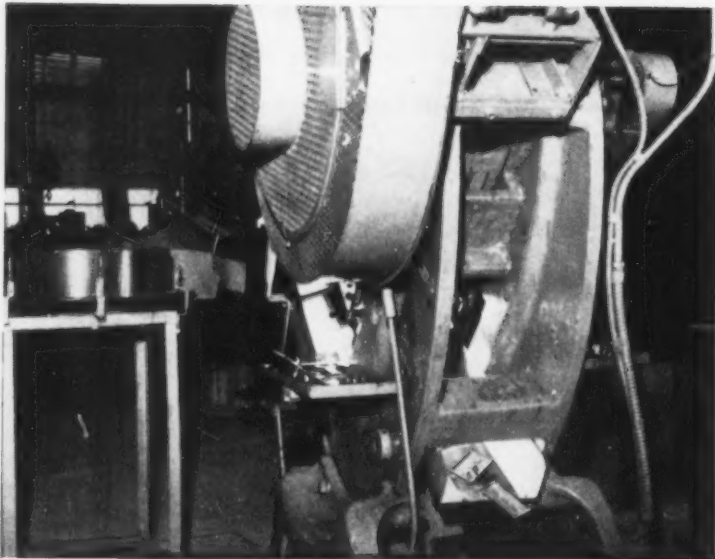
Pre-coated coil can now be widely used in a wide variety of light fabricating operations. Stamping, piercing, intricate embossing and deep and severe drawing can be performed without damage to the finish. It can be supplied with a high degree of uniformity in gage film and thickness, and with a finish more consistent than that resulting from dipping or spraying. Though more expensive than uncoated coil, savings in final production costs can more than make up the difference. One company was able to reduce its paint shop personnel from 15 to one. Another cut scrap 10 pct.

◆ THE ECONOMIC ADVANTAGES of coil stock result from reduced handling, increased press production and lower trim and waste. It has uniformity of gage and temper and permits the stocking of a lower inventory of metal for the manufacture of a wide variety of products. Pre-coated coil—steel, brass, zinc or aluminum coil finished with enamel and lacquer coatings—combines these economies with the process advantages of a metal stock that is finished before fabrication.

Use of prefinished metal can eliminate the need for a paint shop, or the jobbing out of fabricated parts to be dipped or sprayed. In other cases it makes unnecessary overstaffing or oversizing a paint shop to take care of seasonal runs or one shot production orders. When pre-coated coil is used the product is already finished by the supplier, it has a more uniform coating than parts dipped or sprayed and has a finish that many times cannot be satisfactorily applied

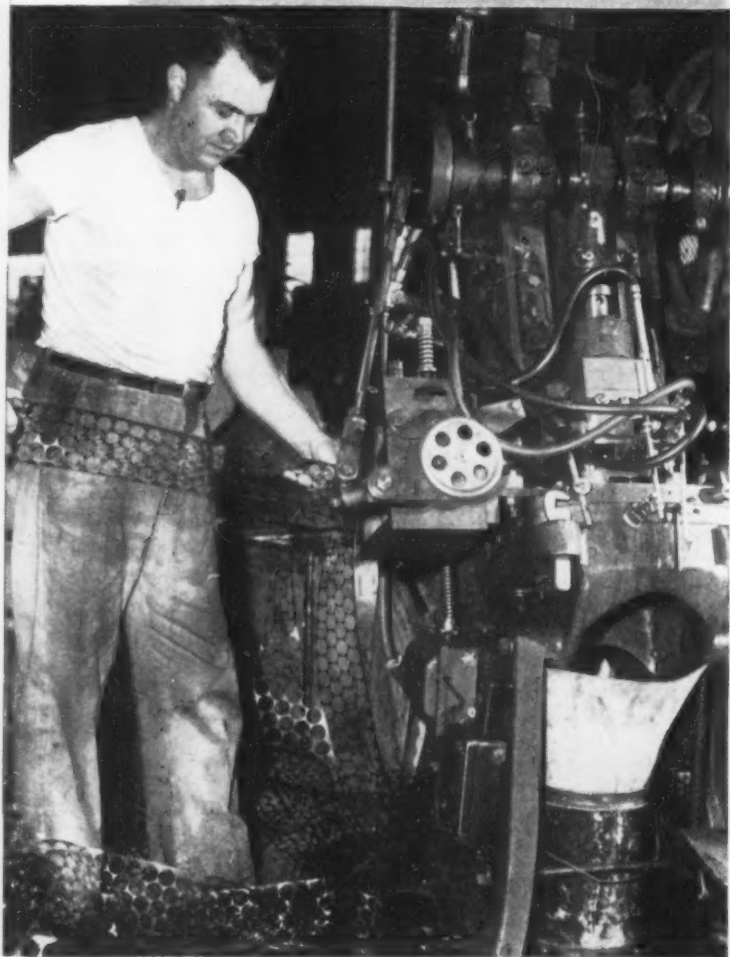


CATALYSTS installed in stacks of Enamelstrip plant prevent discharge of solvent vapors and recover a considerable amount of heat for use in processing.



ADDRESSING MACHINE plates (above), pre-finished, pierced formed, and embossed leave the press at lower right. One operator feeds five presses.

SCRAP SKELETON (below) leaving press indicates high utilization of coated coil. Button parts, pierced and formed in the press require no further finishing.



"Phosphatizing process permits . . . intricate embossing without damage to finish . . ."

after fabrication to parts that are complex or bulky.

Pre-coated coil can now be used successfully and economically in a wide range of fabricating operations. It comes in cold-rolled steel, electro-galvanized steel, electrolytic tin plate, brass, zinc and aluminum, in widths from 7/32 in. to 30 in., and thicknesses ranging from 0.006 in. to 0.050 in. There is a choice of a wide variety of finishes—alkyds, ureas, alkyd-ureas, vinyls, oleo-resins, formaldehydes, sanitrax lacquers, sapons, plastics and semi-plastics, and adhesives—in a wide range of colors. Film thicknesses ranging from 0.00005 in. to 0.002 in. or heavier are obtainable.

Bonded to metal coil

The finish is bonded to the metal coil by a phosphatizing process that permits stamping, piercing, intricate embossing, roll forming, and deep and severe drawing without damage to the finish. It can be applied to both sides of the metal, one side or finished differently on each side. Special coatings can be compounded by the pre-coated supplier.

Case histories gathered by Enamelstrip Corp. show that pre-coated coil is paving the way to better products at lower production costs for many light fabricators. At Kroeder-Rubel, Co., Inc., Brooklyn, N. Y., manufacturer of curtain rods, use of pre-coated coils has cut its paint shop from a 15 to one man operation. Rods are made from continuous strip formed into the finished product over high-speed rolls.

Six operations eliminated

Six handling operations required to clean and finish the product and the problem of racking and dipping long and unwieldy rods has been eliminated. The highly uniform finish is tough enough to take roller forming, piercing and patterned embossing without cracking or flaking.

Pre-finished material has been instrumental in solving handling problems of mass production parts. Bright Star Battery Co., Clifton, N. J., had been stamping its circular battery caps from lithographed black iron sheets. Slitting the 20 x 28 in. sheets, stacking the cut strips, then feeding them into presses, involved costly handling operations. Bright Star switched to a 1½ in. wide red-enameled coil to minimize scrap.

Since then, continuous feed coil has eliminated shearing and much handling. Press output has been increased from 40,000 to 85,000 caps per day. The finish holds up under a draw that produces a deep, narrow rim around the edge of the cap. It also stands the abuse of a sequence

"With precoated coil, pans were drawn in one operation without damage to the finish . . ."

of tumble feed hoppers and automatic assembly operations without marring.

To produce an enamel-coated paint tray 18 $\frac{1}{4}$ x 14 $\frac{1}{4}$ in. of the type used in roller painting operations, requires a 2 in. draw in 0.018 in. steel. Durex, Inc., Newark, N. J., makers of the pans, had no paint shop and unless pre-coated stock was used, the company figured it would cost five cents a pan to finish outside after fabrication. That ruled out uncoated stock. Durex next considered pre-coated sheet, but couldn't get the right size sheet for 4-way blanking. A 2-way sheet was not economical to handle.

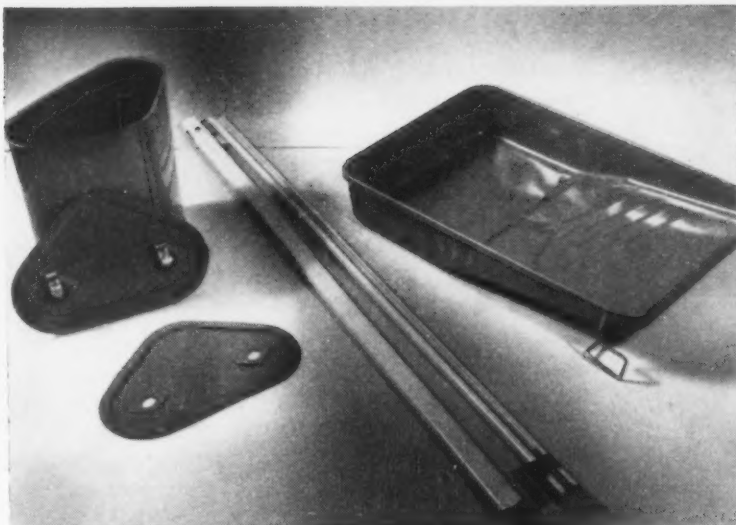
With pre-coated coil the pans were drawn in one operation without damage to the finish. With a lubricant added the pre-coated steel drew better than uncoated steel. Die life was greatly increased and the need for oiling and cleaning each pan eliminated. One man could shear enough coil in one hr for a full day's operation. The same man would take 5 to 6 hr to shear a day's supply of blanks from a 4-part sheet. There was less scrap. An error in shearing a coil wastes only one blank. An error in a sheet could spoil all four parts.

Scrap losses negligible

Jarco Metal Products, Inc., Westbury, N. Y., manufactures cloth-covered buttons, makes the exposed backs of the buttons from enamel coated stock. The company had been using pre-coated sheet but switched to an enameled coil. Now with automatic coil feeds one man can tend six presses. The presses themselves have been speeded up to double output. Production has been increased 12 times and scrap cut more than 10 pct. Elimination of faulty sheet handling increased die life 25 pct.

Universal Stamping Co., Westbury, N. Y., making metal addressing machine plates, used to knock them out of hand-fed sheets 28 to 36 in. long. Because of the stamping loss of half a plate at each end of the sheet, scrap loss was running about 5 pct. With coil feeds, a negligible amount of end-trim now occurs only at the beginning and end of each coil.

Enamelstrip has installed banks of Houdry catalysts in the stacks of all its coating lines. (See sketch on first page of this article.) The catalysts comprise porcelain rods coated with active alumina and mounted in brick life units, see drawing. On each line, metal coil is cleaned, phosphatized, dried, and then coated with synthetic lacquers and enamels. The coil runs through a baking oven where the solvent is driven off. It is these solvent fumes that are oxidized by the catalyst.



LARGE PARTS (above), finished before fabrication include battery-pack can, curtain rods and paint pan. Rods were roller formed pierced and embossed.

SMALL PARTS (below) were fabricated directly from pre-coated coil. They include battery caps, spouts, buckles, buttons and addressing machine plates.

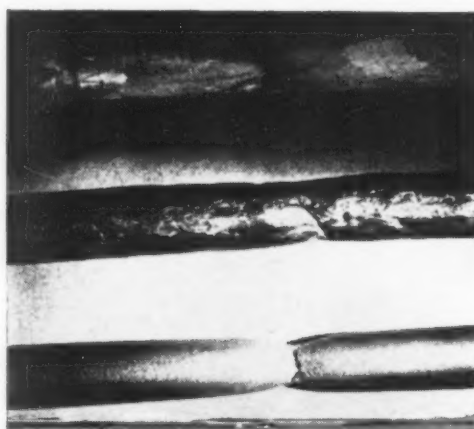


Grain Size KEY TO MECHANICAL PROPERTIES



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Mechanical properties of metals and alloys show a marked rise or fall with changes in grain size. Tensile strength, yield point, hardness, area-contraction show varying degrees of change. Differences in aluminum, copper and brass studied are due to combined effects of orientation and porosity concentration along crystal boundaries. In aluminum extruded shapes, lead ends show the cast structure. Grains in the trailing end are highly deformed due to special flow in extrusion. Extruded rods of small cross-section show preferred orientation.



TENSILE TEST specimens of coarse-grained aluminum, coarse and fine grained alpha brass. One half size.

THE AUTHOR—Mr. Unckel, who has contributed several previous articles to THE IRON AGE, was formerly professor in metallography at The Finland Institute of Technology.

TABLE I
STRENGTH OF COLUMNAR STRUCTURES

Metal	Position in Relation to Specimen Axis	Yield Point, psi	Tensile Strength, psi	Elongation, pct	Contraction of Area, pct
Copper	Parallel	9,700	25,920	29	70
	Perpendicular	7,050	23,400	39	49
Beta Brass	Parallel	15,500	57,000	58	64
	Perpendicular	16,150	55,000	48	60
Zinc	Parallel	6,380	9,300	6.5	1.5
	Perpendicular	2,280	6,550	4	1.5

◆ **GRAIN SIZE** exerts considerable influence on mechanical properties of metals and alloys. Little data is published, however, on the effect of structure on properties in general. In an effort to throw additional light on this subject, a study of the effects of grain size on structure and properties was carried out by the author on several nonferrous metals.

Grain boundaries generally exert a stiffening effect in metals and alloys and counteract plastic glide. Since adjoining grains have different crystallographic orientations, boundary atoms do not fit both lattices and glide planes do not match. At the boundary, slip becomes discontinuous inducing local lattice disturbance which increases resistance to slip. As grain size decreases, total grain boundary increases. Accordingly, the hindering effect to yielding by plastic flow increases. A fine-grained material will therefore be harder and stronger than a coarse-grained material.

In sheet for deep drawing and forming operations, coarse-grained structure gives a rough, objectionable orange peel surface. Surface grains, being free to deform, elongate and contract differently according to their orientations. These stand out in relief or sink back into the surface in varying degrees. The coarser the grain the more conspicuous and objectionable is the effect.

There are two exceptions however. At elevated temperatures under creep conditions a coarse-grained structure is usually preferred. Since part of flow at creep consists of bodily displacement of grains along their boundaries, a coarse-grained metal with little total grain boundary area stands higher loads.¹ In iron-silicon transformer sheet magnetic losses by hysteresis are

less with coarse than with fine-grained material.

In cast metals, grain structure is coarser as cooling is slower through the freezing range. Thick walled portions of a casting are weaker than thin-walled sections taken per unit area.

Properties of both periphery and core of cast specimens of different diameters show a considerable decrease of properties with increasing diameter.² The effect of grain size on tensile strength of cast aluminum alloys, especially with respect to grain-refining additions has been studied.³ With a 4.5 pct Cu alloy strength rose from 28,000 to 38,000 psi when grain size decreased from 2 to 0.2 mm diam. Improvement was credited to modification in intergranular shrinkage cavities in the cast aluminum alloys.

The columnar form of crystals in cast materials, with their long axes perpendicular to cooling surface of the mold, influences mechanical properties. In hot-rolling, slabs with coarse columnar structure often break along crystal boundaries.

Strength of columnar structures have been studied and values, Table I, were found parallel and perpendicular to the columnar crystal. Differences are due to combined effects of orientation and porosity concentration along crystal boundaries. With cubic metals the cube axis is parallel to the columnar axis. Around this axis orientation is random. With hexagonal metals the basal plane is parallel to the columnar axis. Since strength of single cubic crystals is less in the cube axis than in other directions, lower values in the transverse direction are probably accounted for by microporosities accumulated along the columnar boundary.

A striking example of the effect of grain size on properties of cast alloys is presented by

TABLE II
PRESS EFFECT IN ALUMINUM

Alloy and Condition	Position of Specimen	Yield Stress, psi	Tensile Strength, psi	Elongation, psi	Contraction Area, psi	Charpy Impact Value, psi
24S Extruded	Longitudinal	24,000	42,200	17	27	.....
	Transverse	20,100	37,500	12	9	
24S Extruded and Heat Treated	Longitudinal	48,600	74,200	12	21	.....
	Transverse	42,500	58,000	18	7	
24S Extruded Drawn and Heat Treated	Longitudinal	37,100	60,500	22	24	106
	Transverse	37,800	60,700	10	8	
51S Extruded	Longitudinal	13,400	23,200	28	59	.....
	Transverse	12,700	22,700	30	32	
51S Extruded and Heat Treated	Longitudinal	40,500	52,000	17	23	.....
	Transverse	33,300	44,400	18	8	
51S Extruded Drawn and Heat Treated	Longitudinal	27,900	43,000	24	34	149
	Transverse	25,800	38,700	8	7	



STREAKS of intermetallic compounds, extruded 24S rod. 250X.

**"With 70:30 brass and aluminum
different grain sizes were ob-
tained by stretching metal strips"**

hypereutectic aluminum-silicon, a 13 pct Si alloy modified with sodium. Suppression of eutectic temperature and ensuing undercooling lead to extremely fine grain size of the silicon constit-

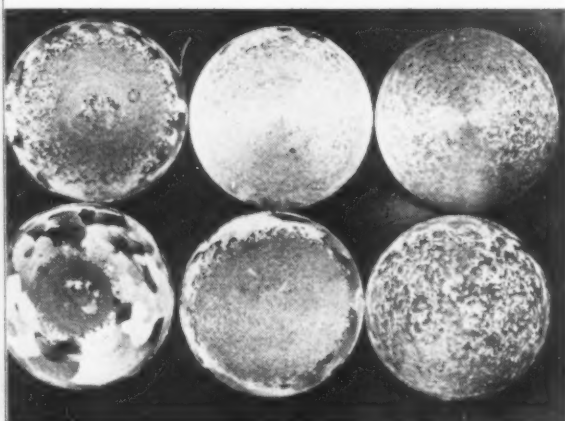
uent, with strength rising from 20,000 to 25,000 psi.

With wrought metals and alloys, coarse grain may arise from recrystallization and grain growth. Small reductions by cold-rolling and drawing lead to coarse grains on annealing. But, secondary grain growth may lead to exceptionally large grains. The structure tends to assume equilibrium angles between the grains.⁴ With an aluminum-manganese alloy, inhomogenous dis-

TABLE III

STRENGTH OF STRETCHED, ANNEALED ROD

Metal	Specimen Size	Grain Diam., mm Mean	Brinell Hardness	Yield Point, psi	Tensile Strength, psi	Elongation, pct	Area Contraction, pct
Copper (sheet)	0.315 in.	0.04	49.5	5,700	31,800	55	63
		0.06	52	6,270	31,400	48	62
		0.11	48	5,850	30,200	40	54
		0.3	48	5,850	30,300	40	56
		0.8	48	6,560	30,200	36	55
Copper (rods)	0.58 in.	0.08	51	9,150	31,700	44	69
		0.1	50	8,720	31,500	46	65
		0.4	48	8,580	31,900	38.5	61
		1.8	47	8,000	30,200	23	62
Tin-Bronze (3.16 pct Sn Sheet)	0.315 in.	0.03	73	14,000	45,500	48	73
		0.8	62	12,100	39,200	39	60
		1.0	61	11,700	40,000	37	56
		1.4	62	11,850	39,200	41.5	58
Tin-Bronze (3 pct Sn rod)	0.585 in.	0.15	85.5	12,500	43,200	51.5	81
		0.9	58	11,100	38,800	49.5	64
		1.5	60	11,100	41,000	80	70.5
		2.0	59	10,800	39,700	42	59
Brass (72.3 pct Cu sheet)	0.315 in.	0.1	52	8,420	43,100	73	72
		0.25	51.5	9,420	42,700	73	74
		0.8	47	8,300	41,600	72	71
		1.9	42	7,280	37,600	66	68
		3.0	43	6,000	35,800	63	70
Brass (62.8 pct Cu)		0.08	63	12,000	46,700	62	64.5
		0.13	60.5	11,400	44,200	52	57
		0.2	56	12,000	42,700	62	55
		0.33	56.5	10,850	41,300	61	54
Brass (55 pct Cu)		0.3	104	18,100	66,000	36	36
		4.0	105	20,600	57,600	29	21
Aluminum (sheet 99.9 pct)	0.315 in.	0.2	23	4,570	10,700	37	77
		0.4	23	4,320	10,800	33	69
		0.8	23	4,280	10,700	28	71
		1.7	22	4,140	10,100	30	70
		3.5	22	4,140	10,100	26	64
		8	24	4,320	9,000	20	72
Aluminum (rods 99.9 pct)	0.79 in.	0.6	24	3,420	10,550	26	82
		0.9	25	3,420	11,300	24	84
		2.0	23	2,980	10,600	29	81
		3.6	23	2,710	10,100	26	86
		8	21	2,570	9,420	25	87
		15	22	.....	9,420	27	78



COARSE GRAIN formation in sections of extruded and heat treated 24S rod. Sections from front, middle, rear portions. Two-thirds size.

tribution of the alloying metal may lead to extremely large grains.⁵

Results of experiments by the author with 70:30 brass and aluminum are given in Table V. Different grain sizes were obtained by stretching metal strips varying amounts before annealing.

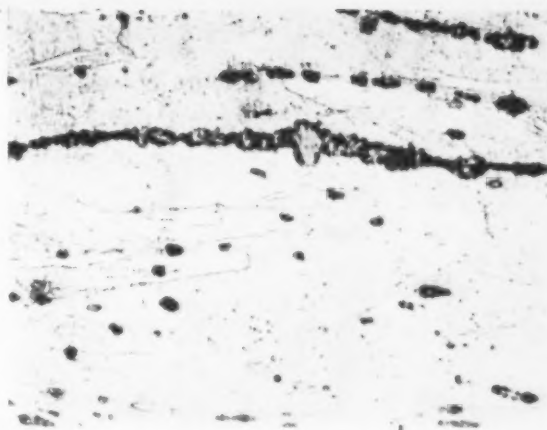
With the same grain size, specimen size has some influence on results. Small sectional area of the specimen gives lower strength, with values approaching the strength of single crystals, when the cross-section is occupied by only one crystal.⁶

Fine-grained materials with greater surface area resist deformation of the grain to a greater extent than do materials with coarse grain structure. In the grain size range studied, total effect on properties follows: Strength of fine grained aluminum specimens was 18 pct higher

TABLE IV

STRENGTH OF 24S ALUMINUM EXTRUSIONS

Shape	Specimen	Grain Size	Tensile Strength, psi	Elongation, pct	Contraction of Area, pct	Charpy Impact Value, psi
Rectangular Cross-Section	Longitudinal	Coarse	55,800	19	30	103
		Fine	76,000	12	17	79
	Transverse	Coarse	74,200	10	12	70
		Fine	67,000	13	13	56
Round Rods	Longitudinal	Coarse	52,800	15	20	.....
		Fine	61,200	12	17	.....
	Tangential	Coarse	54,300	16	13	.....
		Fine	51,300	12	11	.....



LARGE OXIDE inclusions in iron. 250X.

than coarse-grained specimens. With alpha brass, difference in strength is 27 pct. Aluminum shows increased elongation with decreasing grain size and the contraction of area is not materially affected. With brass, elongation decreases with decreasing grain size. The effect on area contraction is indefinite.

With aluminum, small specimen size gives lower strength than large specimen cross-section. With brass this effect amounts to about 15 pct. Elongation falls with decreasing specimen area. Contraction of area seems unaffected. Elongation of single crystals of cubic metals is greater than that of crystal aggregates. Accordingly, coarse-grained structure should give greater elongation. Some grains, however, according to orientation, deform much more than others. Premature breakage occurs before the potential elongation of the other grains is exhausted.

A logarithmic relationship exists between properties and the distance of second-phase particle in 2-phase alloys.⁸ To determine whether the properties follow a straight line law with the inverse of grain size or a logarithmic law, experiments were carried out⁷ with copper, 3 pct tin-bronze, aluminum, alpha brass with 72 pct Cu, alpha plus beta brass with 62.8 pct Cu and a beta brass of 55 pct Cu. Different grain sizes were obtained by stretching strips or rods in the tensile machine different amounts and annealing at different temperatures. Mean values obtained are shown in Table III.

Properties do not seem to be proportional to the inverse grain diameter for all materials. A logarithmic law seems to apply. Values from sheet and rod differ somewhat, probably due to slight differences in composition or impurity content.

With copper, hardness, yield, ultimate strength and area contraction fall slightly with increasing grain diameter. Elongation decreases considerably. With 3 pct tin-bronze, fall in hardness amounts to about 10 pct, yield and ultimate strength to 20 pct, elongation 10 to 20 pct, con-

traction of area is in the region of 25 to 30 pct.

Alpha brass too shows considerable decrease in hardness. Yield and tensile strength are down about 20 pct, elongation 15 pct, and area-contraction 3 pct. Alpha-beta brass shows a 10 pct decrease in hardness, yield and ultimate strength. Elongation remains constant but a 15 pct decrease on area-contraction is found.

Beta brass does not fall in hardness and yield. Decrease in tensile strength is about 10 pct and that of elongation and area-contraction 50 pct. Aluminum sheet gave unchanged hardness and yield point. But strength decreases about 15 pct, elongation 50 pct and area-contraction 10 pct. With rod stock, hardness falls 10 pct, yield point 30 pct and strength 15 pct. Elongation and contraction are approximately constant.

A special kind of coarse grain occurs with aluminum alloy extruded shapes. The first end of the extruded rod shows the remainder of the as cast structure. The read end, by virtue of the special flow in extrusion, is deformed to an exceptionally high degree. Relative deformation within the different layers of the billet is most intense at the periphery of the rod. This high relative deformation at the end of the extrusion stroke together with the temperature fall due to heat conduction to the die side of the container induces some critical work hardening. Later, during solution treatment, this effect leads to extremely large grains. It is often necessary to scrap part of the rods because properties of the coarse-grained zones are inferior.

With coarse-grained 24S aluminum shapes, yield point was 37,000 to 38,500 psi, tensile strength 59,000 to 61,000 psi and elongation 20 pct. With normal fine grained material the values are respectively 44,200 to 45,600 psi, 68,500 to 71,300 psi and 20 pct. Round section rods showed 54,000 psi yield stress, 76,600 psi tensile strength, 11 pct elongation in the coarse-grained peripheral zones against 59,600 psi, 79,000 to 84,000 psi, and 12 pct in the fine grained central zones.

Type 51S aluminum rods containing 0.8 Mg,

"Extruded and heat treated aluminum alloys often show considerably higher strength than if the rods are drawn after extrusion before heat treatment . . . Press effect is due to preferred orientation . . ."

TABLE V

STRENGTH OF METAL STRIPS
Stretched Before Annealing

Metal	Grain Size	Specimen Section in In.	Yield Point, psi	Tensile Strength, psi	Elongation, pct	Contraction in Area pct	Brinell Hardness
Aluminum	12 to 2 mm	0.456		11,400	34	82	19
		0.061	5,270	11,000	26	92	
		0.0093	6,130	10,350	23	85	
Aluminum	2.5 to 0.5 mm	0.495		11,300	39	85	20
		0.061	6,580	11,100	35	90	
		0.0093	6,900	9,750	20	86	
Aluminum	0.1 to 0.2 mm	0.495	5,620	13,000	40	92	21
		0.030	5,420	13,100	36	92	
		0.0093	6,720	12,700	34	88	
Brass (70:30)	2 to 6 mm	0.670	6,120	35,500	82	66	35
		0.110	6,120	34,400	72	64	
		0.030	5,700	30,200	56	66	
Brass	1.2 mm mean	0.670	7,400	38,100	84	72	37
		0.116	8,270	37,000	68	74	
		0.030	12,500	35,700	61	71	
Brass	0.060 mm	0.690	15,900	46,500	60	64	58
		0.110	16,200	47,300	55	65	
		0.030	18,400	46,800	65	67	

1.0 Si, 0.7 Mn, extruded and fully aged, gave in coarse-grained zones a yield stress of 35,600 to 38,500 psi, tensile strength of 40,000 to 41,300 psi, elongation 7 pct. Bhn 96. In fine-grained zones values were 42,800 to 45,500 psi, 50,000 to 51,500 psi, 10 pct elongation and 100 Bhn.

Extruded rods, especially of smaller cross-section, exhibit preferred orientation. The (111) axis, and, with a number of grains the (100) axis, lie in the direction of extrusion. In the transverse direction, orientation is random around this axis. Preferred orientation is usually preserved during heat treatment. Since the (111) axis is strongest and the (100) direction weakest in cubic crystals, preference of these orientations determines the directions in which the material will be stronger. Usually (111), parallel to the extrusion direction, predominates. This gives considerably higher strength in the longitudinal than in the transverse direction of the rod.

In some cases a coarse-grained peripheral zone showed the (100) texture.⁹ In this case, properties in the transverse direction may be better. This effect is again obviated by the effect of streaks of intermediate phases, which mostly occur in aluminum alloys. The streaks reduce the properties in the transverse direction, especially elongation and impact values.

Table IV gives some results obtained with 24S alloy extruded shapes and rod. Extruded and heat treated aluminum alloys often show considerably higher strength than if the rods are drawn after extrusion before heat treatment. This phenomenon is known as "press-effect" and

is due to preferred orientation effects. Drawing leads, through recrystallization on heat treatment, to a more random orientation. Values obtained with 24S and 51S aluminum alloys are shown in Table II. With copper alloys the press effect seems inconsiderable.

Recent investigations show the fatigue limit of alpha brass is largely affected by grain size. A grain size of 0.012 mm diam gives a fatigue limit of 22,000 psi whereas a grain size of 0.131 mm only gives 12,000 psi. Endurance limit of deep drawing brass¹⁰ almost doubled when grain size was reduced from 0.024 to 0.004 mm diam. With steel it has long been known that coarse grain decreases the fatigue limit, especially when the grain boundaries contain free ferrite. Experiments on 51S aluminum indicate fatigue strength is less with coarse-grained than with fine-grained material.

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- ⁵ P. Beck, M. Holzworth, P. Sperry, Am. Inst. Min. Met. Eng. T. P. 2475.
- ⁶ H. Kostran, Metall, Berlin, Vol. 4, 1950, p. 451.
- ⁷ H. Unckel, Z. Metallkunde, Vol. 29, 1937, p. 413.
- ⁸ H. Unckel, Metall, Berlin, Vol. 5, 1941, p. 146.
- ⁹ H. Unckel, Metallwirtschaft, Vol. 21, 1942, p. 185, pp. 531-538.
- ¹⁰ H. Walker, W. Craig, Am. Inst. Min. Met. Eng., 1948, T. P. 2478.

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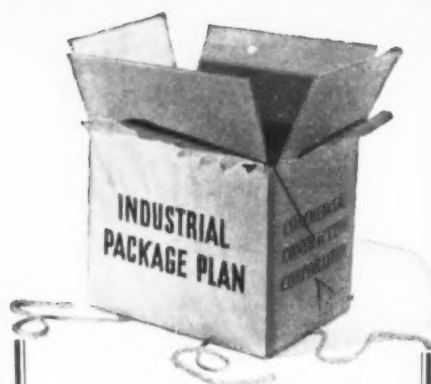


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Technical Briefs

Engineering

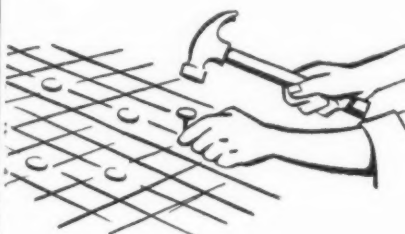
OXYCHLORIDE CEMENT:

Better industrial flooring possible with standard compositions.

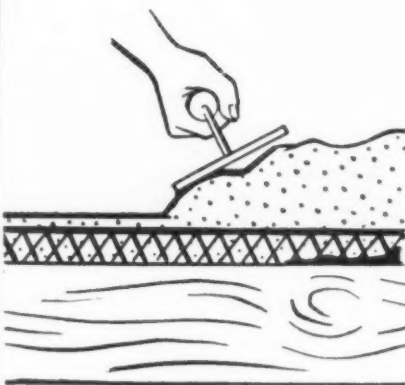
Better industrial flooring will be possible through approval of eight American Standards covering composition, installation and performance of oxychloride cement flooring, J. B. James, executive secretary of the Oxychloride Assn., recently reported.

Demand for standardization in the field of oxychloride cement flooring has developed as larger quantities of this material have been specified for industrial and other types of construction.

Suggestion—Better flooring can be installed through close adherence to simple rules, Mr. James pointed out. Hot water and steam pipes (except radiant heating coils) should not be embedded in subfloor. Pipes passing through floors should be separated by a galvanized sleeve to per-



METALLIC ANCHORING medium should be securely nailed on 6-in. centers over asphalt saturated felt. Use large head galvanizing nails.



USE RUBBER OR PLASTIC resin bonding medium if oxychloride is placed over new concrete.

IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 107. Just indicate the subject heading and the page on which it appears. Be sure to note exactly the information wanted.

mit free movement of the pipes.

Dissimilar metals which may come in contact with the oxychloride composition should be coated with bituminous rubber or synthetic resin compositions. Sub-floors securely nailed to supporting joists assure longer cement life.

Aging Important — New concrete should age 30 days, finished to a reasonably true plane and broomed to a minimum depth of 1/32-in.

If the floor is placed over concrete on grade where it might be exposed to moisture from below, the concrete should be suitably damp-proofed to guard against capillary moisture.

Check Strength—Check the wet mixing equipment to see that it is clean before using and make sure gaging solution is up to proper strength. Gaging solution should be at room temperature before using. See that periodic slump tests are made to be sure the consistency conforms to specifications.

Air temperature should be within specific limits and should not be allowed to decrease more than 20° for at least 24 hours after placing. A thin layer of the composition should be thoroughly worked into all recesses and depressions before spreading the flooring mix.

Dampen—When floor is installed over concrete or other absorptive surfaces where no bonding medium is employed, the surface should be thoroughly dampened

and Production Ideas

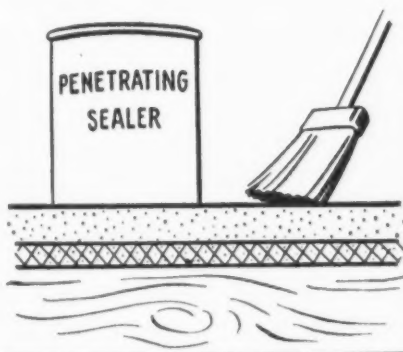
with a gaging solution of full strength. Mix should be spread to thickness specified and leveled by darbying.

Be sure floor is troweled at least twice and the final troweling delayed until composition has set sufficiently so that hard troweling will produce a smooth, dense surface of uniform color. Terazzo and industrial granolithic floors are finished with a grinding machine.

During mixing, air temperature should be within specific limits and should not be allowed to decrease more than 20°F for at least 24 hr after placing.



CLEANING IS IMPORTANT. Oils and greases should be removed from old concrete, and surface roughened by picking to aid mechanical bond. Pick marks should be on 6 in. centers, 1/8 in. deep.



AFTER FINAL SET seal thoroughly cleaned floor with penetrating sealer of low viscosity. Sealer should be applied for at least 30 min before excess is removed.

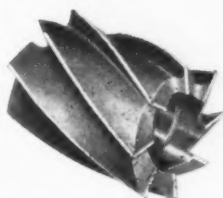
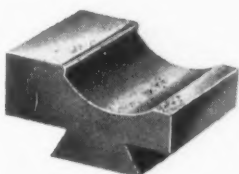
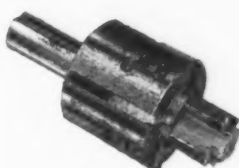
Turn Page

December 18, 1952

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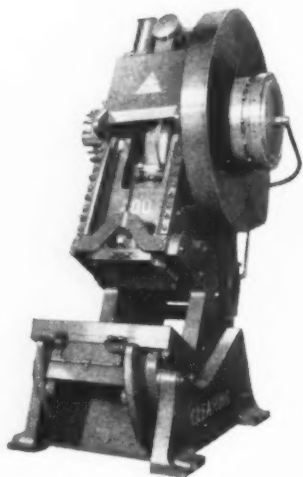


Mary Lou thinks Santa's very wise

She's no expert on industrial production, but Mary Lou completely approves the way Santa does things. Her new roller skates are light in weight, smooth and strong. Her doll buggy and her toy stove and—oh, lots of the things she found under the Christmas tree—have those same desirable characteristics.

Mary Lou hasn't heard of metal forming presses, but already she's learned to prefer the things they make. And because press production holds costs down, Santa was able to provide more things to delight her little girl heart.

As a manufacturer, you can't afford to overlook this significant public preference which manifests itself at such an early age. Production by press methods means easier sales and more of them—of anything made of metal. As you plan your new lines, we urge that you talk to a Clearing man, and find out just what Clearing presses can do for your business.



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—Technical Briefs—

CAST-WELDMENTS:

Combination of foundry and welding techniques cut costs.

Lower costs in the production of complicated castings through combined use of welding and casting techniques have been achieved at Birdsboro Steel & Foundry & Machine Co., Birdsboro, Pa., according to H. E. Edsall, plant superintendent, and F. E. Browne, engineer.

Advantages include: (1) lower pattern costs; (2) lower machining costs through closer adherence to finish dimensions; (3) improved damping properties as compared with all-plate or structural shape fabrication; (4) lower final cost through simplification of design; (5) better service from foundry with employment of simpler techniques; and (6) customer acceptance.

Tough Castings—Birdsboro occasionally was faced with production of difficult castings. By utilizing arcwelding and splitting the pattern into simple units for subsequent assembly, large, complicated cores no longer were required, and flask sizes could be materially reduced.

Such castings can often be produced relatively free of inherent shrinkage, cracks, cavities, sand inclusions or porosity; the structure is more homogenous and by cast-welding many items have been produced with thinner, stronger sections than possible by casting.

Often Less Expensive—The procedure often is less expensive than fabricating the entire structure from plates or shapes, because it requires much less labor for set-up and welding. Simple shapes can be cast in quantity more economically than they can be fabricated. Also, simple shapes welded together or joined to rolled sections can produce a complicated structure at less cost than either casting it in one piece, in specific cases, or fully fabricating it from plate.

Turn Page



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December 18, 1952

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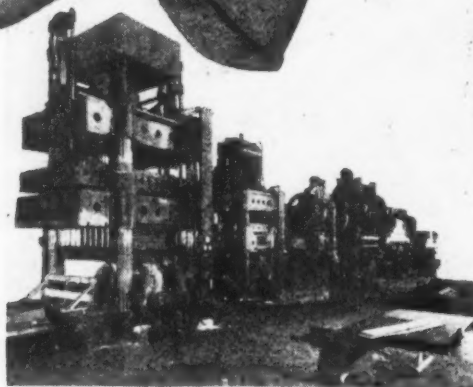
FORMINGS



STAMPINGS



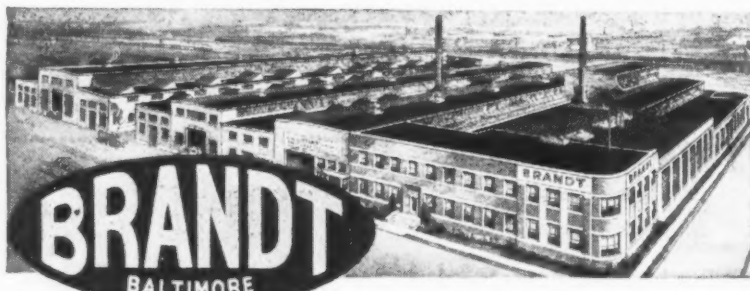
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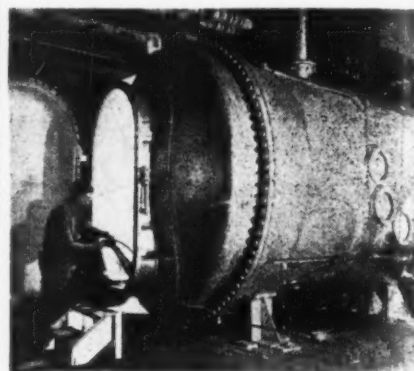
—Technical Briefs—

TESTING:

High altitude conditions simulated in GE test chamber.

Testing equipment 10 miles up in the sky without leaving the ground is possible in a new turbo pump altitude test chamber at General Electric's Aircraft Gas Turbine Div., Lynn, Mass.

An unusual chamber is one of the many testing facilities used to test equipment under the severest conditions which could be encountered in actual flight.



TEST CHAMBER at General Electric's Aircraft Gas Turbine Div., Lynn, Mass., simulates altitude conditions at 10 miles above ground. Chamber is used for testing afterburner fuel pumps.

Conditions—Simulated altitudes of over 60,000 ft can be obtained as well as simulated aircraft climb rates in excess of 20,000 fpm and climb rate angles as high as 60°.

Used primarily for testing reheat (afterburner) fuel pumps for jet engines under varied conditions and altitudes, this chamber has a volume of approximately 950 cu ft and can accommodate a 470 gal capacity fuel tank.

Look In—Engineers can observe pump operation under all conditions of altitude by watching through observation ports provided in the sides of the chamber.

The entire end of the chamber can be removed to permit the installation of larger equipment to be tested under altitude conditions.

Turn Page

VANCORAM



PRODUCTS

PRODUCT	TYPICAL COMPOSITION	APPLICATIONS
ALUMINUM ALLOYS		
Alsifer	Aluminum 20% Silicon 40% Iron 40%	Used principally as a steel deoxidizer and for grain size control.
Deoxidizing Grades	Aluminum 85 to 99%	Standard grades.
Silicon Aluminum	Silicon 5 to 20% Aluminum Bal.	For sand, permanent mold and die casting.
Titanium Aluminum	Titanium 2½ and 5% Aluminum Bal.	For grain refinement and improved physical properties of commercial aluminum alloys.
Vanadium Aluminum	Vanadium 2½, 5, 10% Aluminum Bal.	For control of thermal expansion, electrical resistivity, and grain size of commercial aluminum.

BORON ALLOYS		
Ferro Boron	Boron 14/18% Carbon 1.50% Silicon max. 5.00% Aluminum max. 0.10%	For adding boron to steels and irons.
Vanadium Grainal No. 1	Vanadium 25.00% Aluminum 10.00% Titanium 15.00% Boron 0.20%	Practical and economical intensifiers for controlling and increasing the capacity of steels to harden, and for improving other important engineering and physical properties.
Grainal No. 79	Aluminum 13.00% Titanium 20.00% Zirconium 4.00% Manganese 8.00% Boron 0.50% Silicon 5.00%	

CHROMIUM ALLOYS		
Ferro Chromium Briquettes	Hexagonal. Weigh approx. 3½ lb., contain 2 lb. of chromium.	A practical and convenient form for adding ferro-chromium to the cupola.
High Carbon Grade	Chromium 66/70% Carbon 4/6%	For wrought constructional steels and steel and iron castings.
Iron Foundry Grade	Chromium 62/66% Carbon 4/6% Silicon 6/9%	For alloyed cast irons. Ladle addition readily soluble at lower temperatures of cast iron.
Low Carbon Grades	Chromium 67/72% Carbon ..... .06%, .10%, .15%, .20%, .50%, 1.00% and 2.00% max.	For low carbon chromium steels, especially those with high chromium content, such as stainless steels and heat-resistant types.
Low Carbon Ferrochrome-Silicon	Chromium 39/42% Silicon 40/42% Carbon max. 0.05%	Used in stainless steels to reduce chromium oxide from slag and to add chromium to steel.
Experimental Ferrochrome-Silicon Alloy	Chromium 48/52% Silicon 25/30% Carbon max. 1.50%	For simultaneous addition of chromium and silicon to low alloy steels and cast iron.

SILICON ALLOYS		
Ferro Silicon Briquettes	Two sizes, both cylindrical. The smaller contains 1 lb. of silicon; the larger, 2 lbs. of silicon.	A practical and convenient form for adding ferro-silicon to the cupola.
25/30% Grade	Silicon 25/30%	To deoxidize open hearth steels and add silicon to cast iron.
50% Grade	Silicon 47/52%	To deoxidize and add silicon to steels and cast irons.
75% Grade	Silicon 74/79%	For high content silicon steels.
80/85% Grade	Silicon 80/84.9%	For high silicon addition to steel; for slag treatment and graphitization of iron; for making magnesium.
85/90% Grade	Silicon 85/89.9%	
90/95% Grade	Silicon 90/95%	
Silicon Metal	Silicon min. 96%	For making aluminum, other non-ferrous alloys and silicones.

PRODUCT	TYPICAL COMPOSITION	APPLICATIONS
SPECIAL FOUNDRY ALLOYS		
Graphidox No. 4	Silicon 48/52% Titanium 9/11% Calcium 5/7%	Graphitizer for high strength cast irons; reduces chill; supplementary deoxidizer for cast steel.
Noduloy No. 12	Magnesium 10.5/13% Copper 15/18% Silicon 37/41% Iron Bal.	Magnesium-containing alloys for addition to molten cast iron for manufacture of ductile (nodular) iron.
Noduloy No. 3	Magnesium 13.5/16.5% Silicon 62/67% Iron Bal.	
V-5 Foundry Alloy	Chromium 38/42% Silicon 17/19% Manganese 8/11%	To reduce chill and increase strength and hardness of cast iron.

TITANIUM ALLOYS		
Ferro Titanium	Titanium 15/18% Carbon 6/8%	To control rimming action and deoxidize steel.
High Carbon Grade	Titanium 17/21% Carbon 3/4.50%	To deoxidize and to add titanium to killed steels.
Medium Carbon Grade	Titanium 20/25% Carbon max. 0.10% Silicon max. 4.00% Aluminum max. 3.50%	Carbide stabilizer in high chromium corrosion-resistant steels of extremely low aluminum content. Deoxidizer for some steels.
Low Carbon Grades 25% Titanium	Titanium 25/32% Carbon max. 0.10% Silicon max. 4.00% Aluminum max. 2.00%	Alloy of high titanium-to-aluminum ratio for adding relatively large amounts of titanium to stainless and heat-resistant steels.
25/32% Titanium Special	Titanium 38/43% Carbon max. 0.10% Silicon max. 4.00% Aluminum max. 8.00%	Carbide stabilizer in high chromium corrosion-resistant steels.
40% Titanium		

VANADIUM ALLOYS		
Ferro Vanadium	Vanadium 38/42% Silicon 7/11% Carbon about 1%	Imports remarkable improvement in physical properties of iron with no sacrifice of machinability.
Iron Foundry Grade	Vanadium 50/55% Silicon max. 7.50% Carbon max. 3.00%	For low vanadium steels and vanadium cast irons.
Grade A (Open Hearth)	Vanadium 50/55% Silicon max. 3.50% Carbon max. 0.50%	For tool steels and other high vanadium steels requiring a limited silicon addition.
Grade B (Crucible)	Vanadium 50/55% Silicon max. 3.50% Carbon max. 0.50%	
Grade C (Primor)	Vanadium 50/55% Silicon 70/80% Carbon max. 1.25% Carbon max. 0.20%	For making the highest vanadium and the lowest silicon addition to tool steels.
Vanadium Metal 90% Grade	Vanadium 91.15% Aluminum 2.25% Silicon 0.50% Carbon 0.17%	For special iron-free (non-ferrous) or low iron alloys or low impurity ferrous alloys.
95% Grade	Vanadium 95.18% Aluminum 2.00% Silicon 0.27% Carbon 0.40%	Principally for research on the properties of pure alloys. For use in applications where very low iron content is essential.
Vanadium Pentoxide, Tech. Fused Form	V ₂ O ₅ 88/92%	A source of vanadium in basic electric furnace steels. A base for numerous chemical compounds.
Air-Dried Form	V ₂ O ₅ 83/85%	Base for chemical compounds.
Ammonium Meta Vanadate, Tech.	NH ₄ VO ₃ min. 99%	For making sulphuric acid, synthetic organic compounds and vanadium chemicals.

Also special alloys, chemicals and metals of Aluminum, Chromium, Silicon, Titanium and Vanadium.

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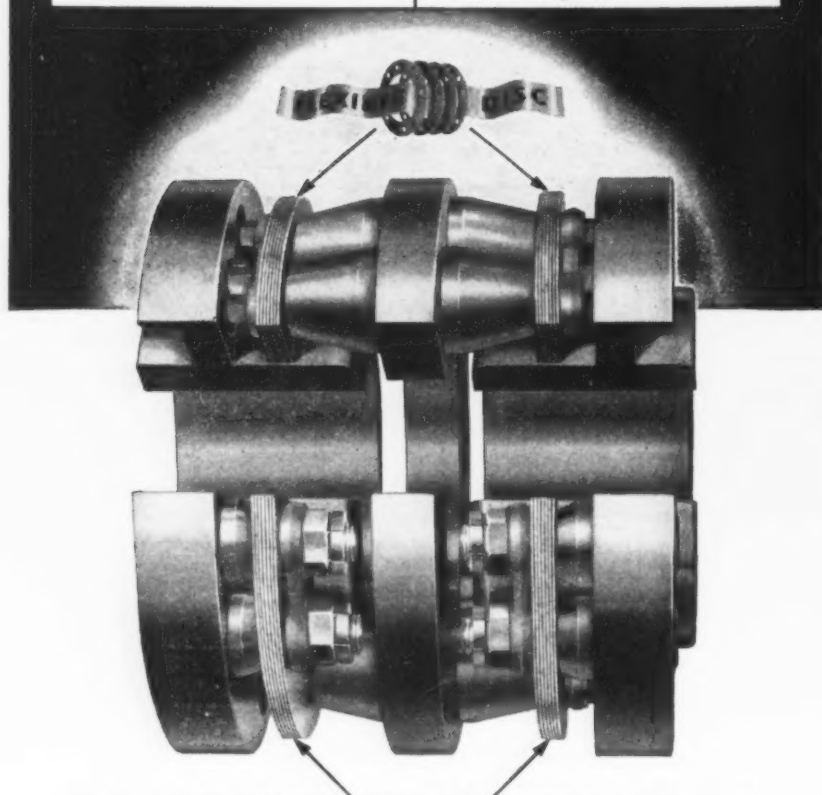
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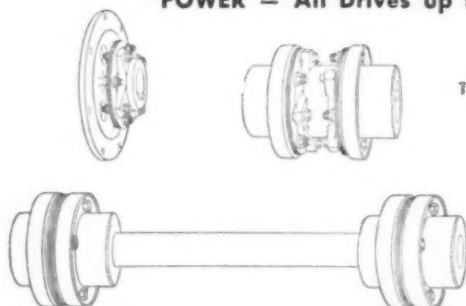
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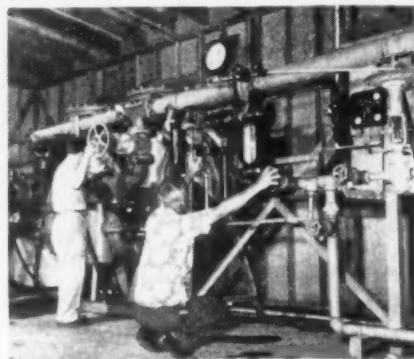
Technical Briefs

ROCKETS:

Fuel consumption accurately predicted in Ryan setup.

Rocket motors in flight have a phenomenal fuel consumption. Ryan engineers must know exactly how much each motor will burn before it begins its spectacular mission. To do this, a novel technique uses a \$12,000 combination of plumber's fittings and engineering instruments.

Flow Test—Under the direction of Bert Holland, rocket project engineer, and C. C. Hasty, plant design engineer, the flow test arrangement shown here was designed and built. The system pours huge volumes of water through the rocket motors and carefully measures the amounts and pressures.



ORGANIZED JUMBLE of instruments and plumbing fittings helps Ryan predict rocket fuel consumption by analyzing water flow.

By substituting water for rocket fuels and applying conversion factors to correct for varying viscosities, densities, temperatures and other factors, Ryan engineers can determine the complete hydraulic characteristics of each motor without firing it.

Tons of Water — Water is brought in through a 5-inch line. Two tons of water per min can be flushed through the system. It is regulated in pressure, measured and filtered before coursing through the rocket motors.

Flow meters indicate rate of flow in pounds per sec., and pres-

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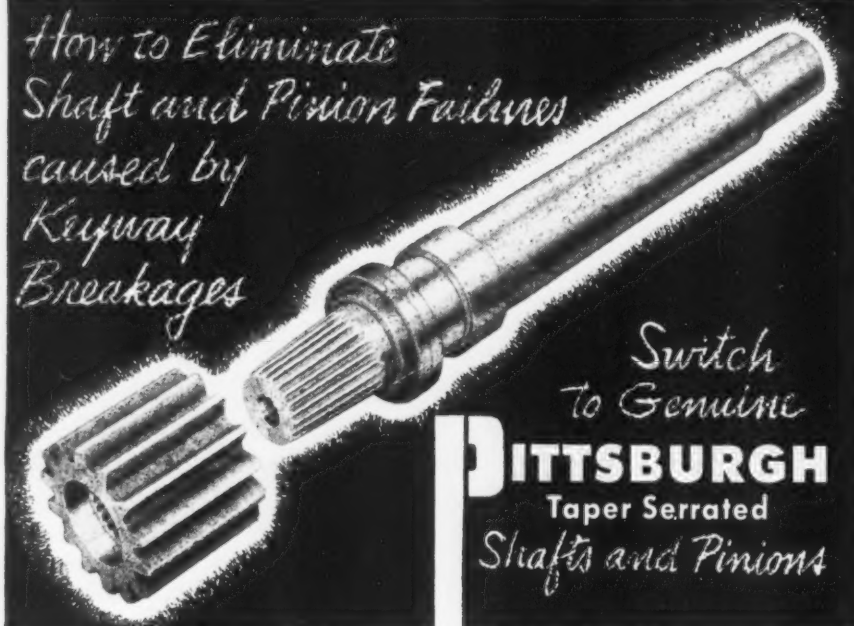


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Keyways weaken both shaft and pinion and frequently cause failures and work stoppages. But this can be eliminated by using PITTSBURGH Taper Serrated Shafts and Pinions which provide an all-around **V-lock** for great strength and endurance.

The male serrations on the shaft lock perfectly in the female serrations of the pinion. There is just enough taper so the pinion can be easily "shocked" on or off the shaft. One user reports no failure on more than 75 PITTSBURGH Taper Serrated Shafts and Pinions installed during a 4 1/2 year period.

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Technical Briefs

sure gages show pressures in psi. From these figures, Ryan engineers calculate the pressure drop through the motors and develop the hydraulic characteristic curves needed to chart performance.

Filtered—To prevent corrosion of the polished rocket surfaces, the water is passed through two large filters which remove particles over 10 microns in diam. Undoubtedly, this water is the cleanest water in San Diego from a physical standpoint.

The unique flow test facility is assuming increased importance because of the stepped up production of rocket motors which Ryan is building for the Firestone Tire & Rubber Co. and for Douglas Aircraft Co.

Mills Two Ways at Once

Table sizes up to 80 by 20 in., table movement accuracy within 0.0004 in. and simple single-lever control are reported possible with a heavy-duty, precision German vertical milling machine recently received in United States by Kurt Orban Co., Inc., New York.



ENDURANCE LIMIT of a Rollpin is determined on a Baldwin-Lima-Hamilton fatigue testing machine at Elastic Stop Nut Corp. of America. In the setup, the pin connects a fixed solid shaft slipped inside an oscillating hub. Tests are used to compile design data, evaluate new designs, materials, heat treatments and manufacturing methods.

Turn Page

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AND
WE'RE GOING
PLACES"



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Know-How and ample Reserves qualify
us to ship you high grade iron ore today,
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The Cleveland-Cliffs Iron Company

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POWDER TOOLS:

Joint board OK's their use by New York electrical workers.

Unanimous approval by the Joint Industry Board of the Electrical Industry of New York City has been given to use a powder-actuated fastening tools on all electrical jobs in the New York area.

These tools, which employ a

powder-actuated charge to drive studs, pins and screws into steel, wood or concrete, will be used by electrical workers of Local 3, International Brotherhood of Electrical workers, A.F.L. Panel boxes, hangers and other fixtures which support wiring are hung from the studs, pins and screws driven by the powder-actuated tools.

Old Style — Methods approved heretofore, required use of various hand tools to drill holes in metal or concrete. In the case of concrete, at times it was necessary to pour fresh concrete and allow bolts to "set" before being secured.

As a result of this unanimous decision reached voluntarily by the Industry Board of union leaders and contractors, electrical installations will be made at lower cost to builders and at higher efficiency. The powder-actuated fastening tools permit as many as three or more fastenings a minute.

Must Certify — Under the approval ruling, makers of powder-actuated fastening tools are required to instruct electrical workers in the use of their tools, to certify that operators are qualified.

PROGRESS:

Chemical kinetics, other engineering developments reviewed.

A brief summary of some major engineering developments, and where they may lead industry, was recently presented the American Society of Mechanical Engineers at their annual meeting in New York by Gerard Piel of Scientific American.

Of top interest is chemical kinetics. Basic chemical plants of the future may be modeled on the jet engine. At laboratories where fundamental research is being conducted, with the view of controlling the combustion rate and the power and thrust delivered by engines for aircraft purposes, the engineers are intrigued by the enormous possibilities of chemical kinetics.

Mid-Flight—Arrest in mid-flight of transient chemical compounds that turn up at various zones in a combustion chamber—and the trapping and stabilization of these compounds before they disappear in the waste products of combustion is a distinct possibility.

These jet streams move at 1500 fps. Engineers are talking about using a reaction chamber of this kind for conducting basic chemical reactions of the future chemical industry.

Turn Page

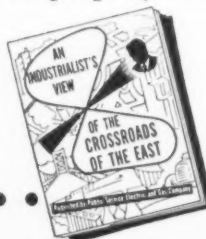
What's New in New Jersey



The significance of the zero you see here is that it represents the fact that in New Jersey there is *no* state sales tax . . . and there is *no* state income tax. That's news in these days of soaring taxes.

What's the result? Today many *new* industries are considering plant locations in New Jersey, the Crossroads of the East, where the taxation climate is favorable to industry. Here are real advantages to all business — large and small — because here there is *no* individual state income tax . . . *no* state corporation income tax . . . *no* state sales tax . . . and complete exemption of intangible personal property from local property taxes.

Want to know more about the news in New Jersey which affects all industry? Write Box D, 70 Park Place, Newark, N. J. for the brochure, "An Industrialist's View of the Crossroads of the East."



PUBLIC SERVICE
... AT THE CROSSROADS OF THE EAST

Even with 8 Hands Could Sitatāpatrārājītā Have a Finger in So Many Pies?



● Meet the goddess of Tibetan mythology—three-headed and eight-armed. Quite a versatile gal, according to ancient lore.



Now Meet Mr. Lyon Dealer

He spots the goddess two heads and six arms and still matches her versatility. Here's why—

● Lyon Steel Equipment Dealers serve virtually every segment of business and industry—with a diversified line of products totalling more than 1500 standard Lyon items. (A few typical products are shown below.) Factories,

shops, warehouses, offices, churches, clubs, hospitals, homes—Lyon Dealers serve them all.

Lyon engineering and production facilities are also available for special contract work.

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- Parts Cases
- Economy Locker Racks
- New Freedom Kitchens
- Toolroom Equipment
- Wood Working Benches
- Display Equipment
- Flat Drawer Files
- Revolving Bins
- Hanging Cabinets
- Filing Cabinets
- Folding Chairs
- Work Benches
- Bench Drawers
- Service Carts
- Sorting Files
- Drawer Units
- Hopper Bins
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- Shop Boxes
- Tool Trays
- Shop Desks

A WORD TO THE WISE

About Metal Cleaning

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will promptly bring
detailed information.



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Exclusive Sales Agents
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QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE
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—Technical Briefs—

NEW LABORATORY:

Allegheny Ludlum's new research lab opened at Brackenridge, Pa.

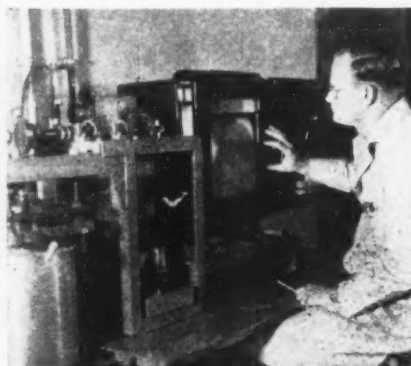
A new \$500,000 research laboratory was recently opened by Allegheny Ludlum Steel Corp. at Brackenridge, Pa. Known as the Vere B. Browne Research Laboratory, the new unit combines the latest scientific equipment available for study of steels and steel production methods.



ULTRASONIC GENERATOR for experimental descaling of steel is one of many pieces of special equipment.



RECORDING DILATOMETER: Thermal expansion characteristics of metals are recorded on equipment designed especially for testing alloy steels with low thermal expansion qualities, such as those used for cone sections of TV tubes.



ANNEALING PROGRAMMER: Control panel at right center automatically programs annealing cycle in electrical materials section. Experimental annealing is done in controlled furnace at left.

Turn Page

Metal Stamping Facilities

by *Lansing*

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reading and less

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2 and 3 of your

IRON AGE

EVERY week and let the

Digest of the Week in

Metal Working help

you find your favorite

features.

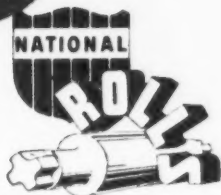
IT PAYS TO READ

IRON AGE ADS TOO!



Take a good
look at a
National Roll

FROM THE VIEWPOINT of operations, costs, and management, National Rolls are a long term investment in roll satisfaction. They turn out top quality work at low cost per ton. The care and precision that go into their manufacture are directly reflected in their dependable performance in the stands. Try them and see.



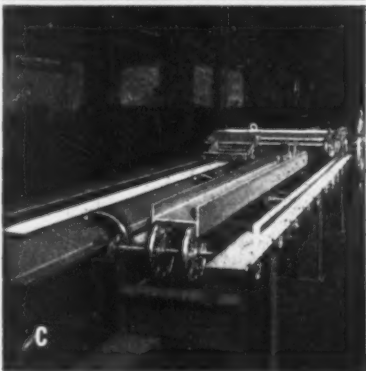
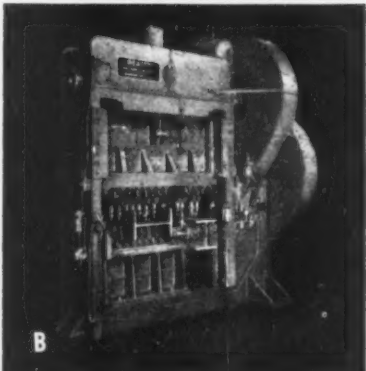
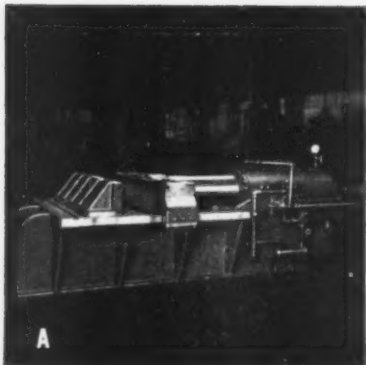
THE NATIONAL ROLL & FOUNDRY COMPANY

Avonmore, Pennsylvania

SPECIALISTS IN IRON AND ALLOY IRON ROLLS AND CASTINGS

December 18, 1952

167



A. BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging and bending.

B. BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.

C. BEATTY Spacing Table handles web and flange punching without roll adjustment.

D. BEATTY Gap Type Press for forming, bending, flanging, pressing. Capacity 250 tons.

E. BEATTY Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.

MATCH-MAKERS

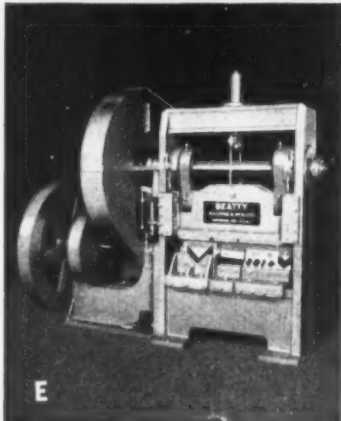
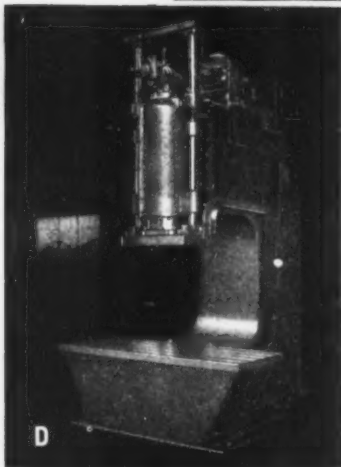


BEATTY specializes in making machines to match various heavy metal working conditions and problems. If one of the machines shown can't be modified to suit your needs, we'll design and build one that does. Broad experience in varied metal working fields has taught us that there is always a better way to solve production problems. Let one of our engineers show you how the BEATTY way is a BETTER way to increased production and economy.

BEATTY

MACHINE & MFG. CO.

HAMMOND • INDIANA



Technical Briefs

BIG SPAN:

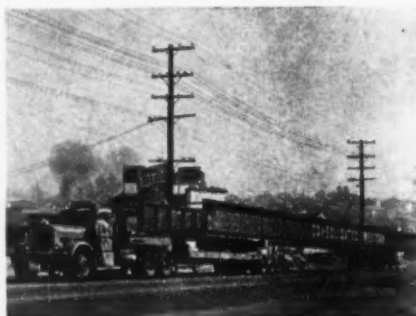
Fabricated steel overpass span
136 ft long carried on trailer.

When engineers of the Consolidated Western Steel Div., United States Steel told highway department officials they were ready to erect the final span of a 309 ft long pedestrian overpass on the Ramona Freeway in Los Angeles, the Los Angeles Freeway was closed to traffic.

The span, one of the longest single pieces of fabricated steel ever to be transported on the streets of Los Angeles and the Freeway, was 136 ft long. Added to the length of the truck cab, the



SIXTEEN WHEELS are needed to trundle this 136-ft fabricated steel pedestrian overpass span through Los Angeles and along the LA Freeway.



HAULING JOB completed, big cranes take over and slowly move the long span in place for the final lift.

entire unit measured over 178 ft in length.

Stared—Motorists and pedestrians alike stared when the trailer caravan rolled out of the Consolidated Western plant at Maywood and headed for the overpass 10 miles away with the 22-ton fabricated bridge section aboard.

Some difficulty was experienced

Turn Page

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MORE CUTS PER BLADE**

Specify
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1 1/2" x .065 AT

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SAFE-FLEX
WELDED EDGE
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IN U.S.A.

A complete line for all hand
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to length and welded

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Straight, scallop or wavy-
edge types

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HACKSAWS, BAND SAWS and BAND KNIVES

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THROUGH YOUR
**INDUSTRIAL
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Prompt delivery
Dependable service
Quality products

—Technical Briefs—

at the entrance-bridge to the Freeway, due to lack of clearance. Because of telephone poles at the rear of the turn and the dizzy "s" approach to the busy Freeway below, the truck and its package had to back out and use another entrance of the Freeway.

Lifted—When the truck arrived at the overpass site, engineers from Consolidated Western were waiting with three 15-ton cranes, all set to lift the span in place on the concrete buttresses.

The truckers brought the span parallel to the concrete supports where cranes lifted it 35 ft in the air, to be joined to the other two spans already in place. Two cranes lifted the rear end of the span so that it would clear the center support. With perfect coordination between the crane operators and the truck driver, the long job was completed. The overpass will eliminate a dangerous crossing.

CLEAN AIR:

Activated carbon, catalytic burners eliminate complaints.

Industrial and chemical plants in suburban residential areas frequently find that they have unwittingly created air pollution problems by discharging process gases to the surrounding atmosphere. Ace Wire Mills, Inc., Paterson, N. J., had such a problem.

Ace Wire makes copper transformer wire which is coated with synthetic lacquer, baked on after an immersion bath. Tandem ovens have individual stacks vented to the atmosphere. Baking temperatures are about 650° F to burn off all combustible gases and most of the solids in lacquer solvents.

Complaints—Stack effluvia containing odorous non-combustible gases and solids caused a serious neighborhood nuisance.

Analysis of the lacquers and solvents employed showed the gases generated could be readily



FILTERS, PRESSURE BLOWER are chief components in unit which cleans stack effluent.

absorbed by activated carbon.

Emitted — Quantity of gases emitted by all ovens operating simultaneously was found to be approximately 250 cfm. Since for optimum adsorption efficiency air passing through activated carbon equipment should not exceed 118° F, this temperature was established as the maximum through the system.

It was necessary to dilute the stack gases with 5750 cfm of 95° F plant air to maintain the 118° limit.

A slight negative pressure was maintained in the coating room to prevent exfiltration through window and door cracks causing contamination of outdoor air at street level.

Why Lift Extra Tonnage?



Walker Lifting Magnet operates with valuable saving of electrical energy . . . high ratio lifting magnet gives maximum lifting with minimum weight. Walker's advanced design insures more payload per lift . . . gets into corners . . . reduces supplementary hand work.

LESS WEIGHT—MORE POWER!

O. S. WALKER CO. Inc.
WORCESTER 6, MASSACHUSETTS

LUMIN USED ON UN BUILDING

Aluminum on the United Nations building in New York City is not being cleaned with Lava soap, but with Lumin Cleaner and Lumin Wash, according to Lumin Sales Corp., New York. Reprint of a statement that Lava soap is used to clean the building's aluminum appeared in this column Sept. 25.

R. V. Elms, chief purchasing agent of the United Nations, confirms that the Lumin products are the only kind supplied to the cleaning and maintenance company for cleaning and protecting the aluminum on the building.

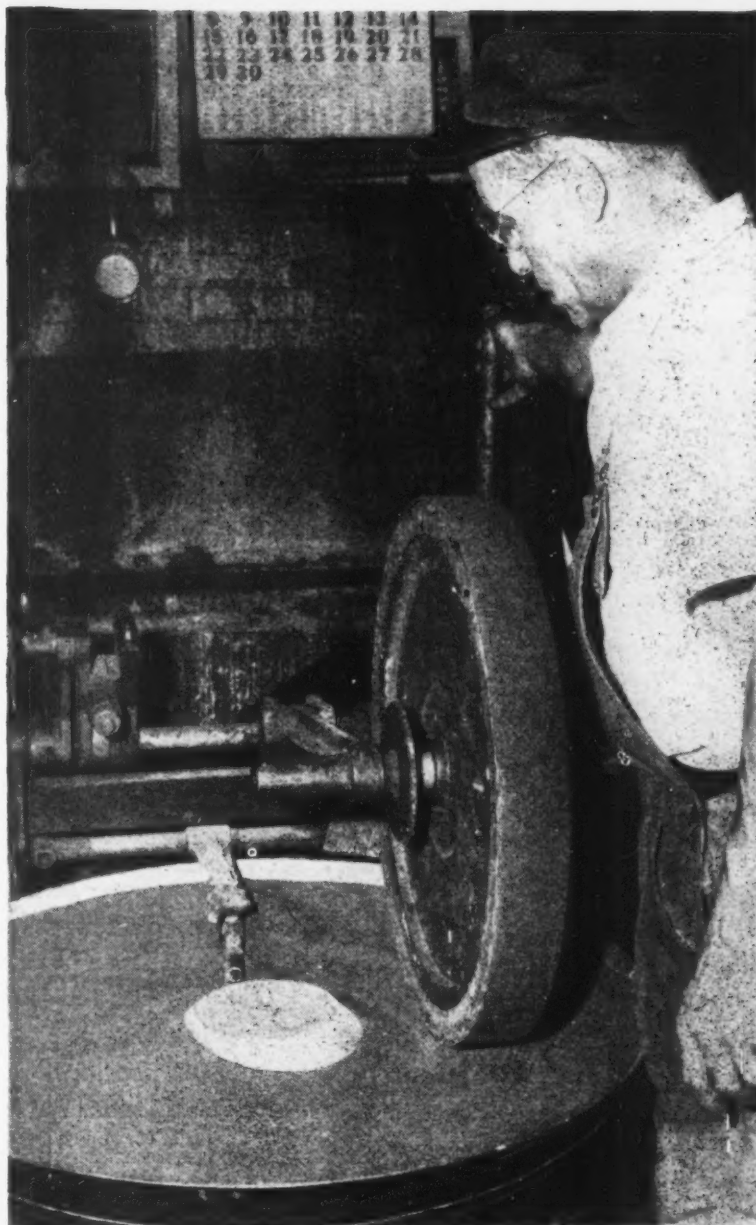
Put these practical tips to work for you

**44-page book shows you
how to set up
metal polishing wheels
and belts**

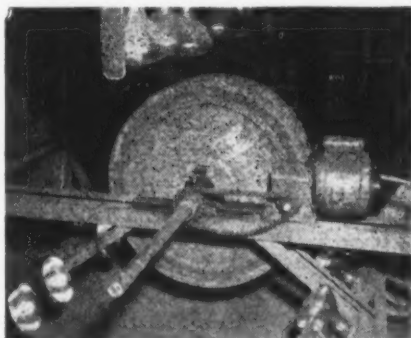


Plan now to take advantage of the wealth of information in the Norton Booklet No. 1340, "Setting Up Polishing Wheels and Belts." This useful

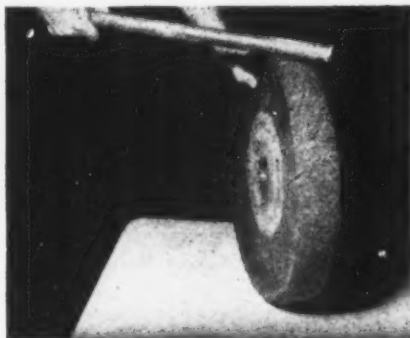
booklet tells how to prepare the glue, how to set up wheels using either glue or cement, how to set up abrasive belts, how to get the best results from polishing. It contains detailed information on abrasive grain for polishing, including tables for selecting grains. Norton Company, Worcester 6, Mass. Distributors in all principal cities. Export: Norton, Behr-Manning Overseas Inc., Worcester 6, Mass.



HOW TO SET UP a polishing wheel. Glued wheel, shown here, is automatically rolled in a trough of abrasive grain. To minimize jelling, the setting-up operation is carried out as quickly as possible.



HOW TO DRY a polishing wheel. Infra-red lamps dry wheels faster and permit smaller inventory of wheels. Note mechanism for rotating wheels easily. Ideal dry room maintains temperature of 85° F. and 50% relative humidity. When wheel cracks readily, it is dry.



HOW TO CRACK the wheel head. Wheel face is hit at about a 45° angle, being struck completely around the wheel once or twice. It is then hit at an angle that forms an "X" with the first series of cracks. A round bar or pipe, *not* a sharp tool, is used.

NORTON
ABRASIVES

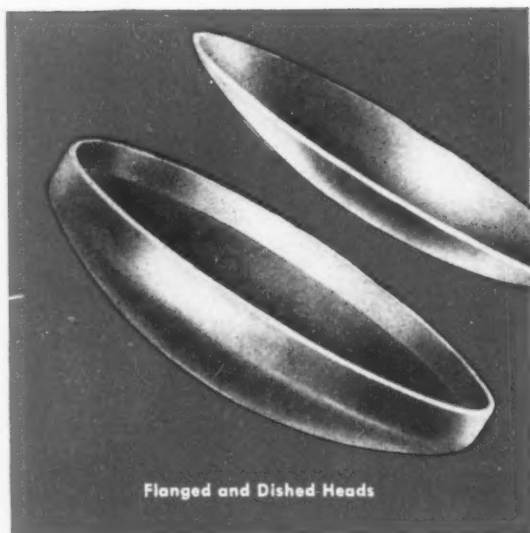
*Making better products
to make
other products better*

heads---you win

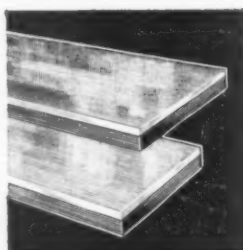


***when they're made by**

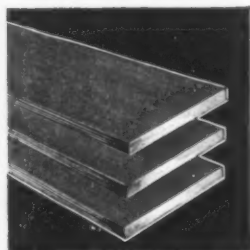
CLAYMONT



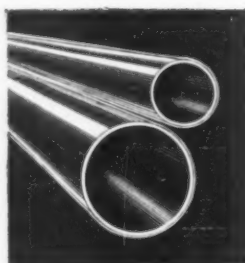
Flanged and Dished Heads



Stainless-Clad
Steel Plates



Alloy and Carbon
Steel Plates



Large Diameter
Welded Steel Pipe

Whatever your needs in flanged and dished heads, you're a winner every time when you call for heads by Claymont.

We can always meet your most exacting specifications because with us the spinning of flanged and dished heads is more than just a job—it's an art into which we put the most painstaking care and specialized know-how.

Our flanging department can supply you with flanged and dished heads in diameters from 9 inches to 19 feet and in gauges from 3/16-inch to 6 inches. Made in carbon steel, alloy steel or with stainless steel cladding. We are also prepared to handle head forming operations on both ferrous and non-ferrous metal circles supplied by the customer.

Other Claymont products include Stainless-Clad Steel Plates, Alloy and Carbon Steel Plates, Large Diameter Welded Steel Pipe.

Write or call Claymont Steel Products Department, Wickwire Spencer Steel Division, Claymont, Delaware.

THE COLORADO FUEL AND IRON CORPORATION • Denver, Colorado
THE CALIFORNIA WIRE CLOTH CORPORATION • Oakland, California
WICKWIRE SPENCER STEEL DIVISION • Atlanta • Boston • Buffalo
Chicago • Detroit • New York • Philadelphia

CLAYMONT STEEL PRODUCTS

PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION



Durable Goods Manufacturers Aiming High for 1953

Steel sales people frankly surprised at growing pressure from variety of customers . . . Balancing of supply and demand may come later than had been expected by mills.

Optimism of steel using manufacturers is growing by leaps and bounds. Instead of relaxing pressure on their steel suppliers, they are increasing it. This is reflected by mill sales officials who are frankly surprised at the continuing clamor for steel from nearly all types of durable goods fabricators.

Many steel people had expected first signs of easing demand to start showing about the first of the year. This, they thought, would forecast a balancing of supply and demand about the middle of the year. It might still turn out that way, but the people who have to say "yes" or "no" to anxious customers aren't as sure as they were a few weeks ago. If anything, the steel market looks tighter now than it has for several weeks.

Front Line Demand—Where is all the pressure for steel delivery coming from? The answer is just about everybody. Autos, appliances, oil and gas, freight cars, construction, and military hard goods are a few front-line bulwarks of demand. But many other less easily classified consumers are just as hungry for steel.

Auto makers have plotted an ever-rising production line for themselves through the first half of 1953. After going 'round and 'round with National Production Authority, they have finally won permission to build 1.5 million cars in the second quarter. (First quarter ceiling is 1.25 million.) They will now start beating the drums for enough metal to do the job. During the entire year they would like to build 6.5 million cars and 1.5 million trucks.

More Optimism—Whether or not they can build and sell that many cars, the very existence of such an ambitious production target will exert plenty of pressure on the market for a long while.

Appliance makers are far more optimistic than they were a year ago. Continuing high levels of retail sales, combined with interrupted shipments during the steel strike last summer, have over-corrected inventories that had grown fat. Christmas sales in several lines are reported better than had been expected. Expanded manufacturing capacity and renewed optimism are causing an exciting run on steel suppliers.

Aim High—Oil country people, though trying to extricate themselves from expensive conversion deals, are still exerting full pressure on the mills. They want more pipe than current capacity can turn out. Petroleum Administration for Defense has set up a well drilling program calling for 9000 more wells in 1953 than the expected record 46,000 in 1952. After that, they want an annual increment of 5000 new wells. Plate requirements for storage tanks are also expected to rise under pressure from fuel suppliers.

Dusted Off—The often mentioned but seldom met freight car program is being dusted off again. The railroads have renewed their request for construction of 10,000 new freight cars per month. Their goal is a 1,850,000 car fleet by the end of 1954.

The already-staggering freight car building program was knocked

flat on its back by the steel strike last summer. So far, it has not recovered. Though some needed steel items are not too tough to get, structurals, plates, and channels are proving real production bottlenecks.

Goods News—The Jan. 1 easing of construction controls (previously scheduled for May 1) means that perhaps as many as 30 pct of building projects will not have to have CMP tickets for their supplies of steel and copper. The relaxed rules on self-certification will not apply to aluminum until May 1.

A long list of highway jobs will be eating up enormous tonnages of structurals, plate, and reinforcing bars. Most fabricators expect 1953 to be the biggest year in history for erection of bridges. This is the brightest spot in the construction field, but the outlook for schools, hospitals, and other institutional jobs is almost as good.

No Early Result—Steel consumers should not expect any early easing to result from the Defense Dept. plan to stretch out its tank and truck program. This will not affect production schedules until the second half of 1953. The philosophical manner in which these stretch outs were accepted is indicative of Detroit optimism. Most auto executives seemed glad of the release on manpower which could be turned on civilian production.

On top of strong pressure from their regular customers, mills are besieged by consumers anxious to augment their supplies with conversion. Most of this business has to be turned down because it involves breaking down of ingots, and blooming mills are still a bottleneck.

*For this Automobile
Fan Shaft...*



The right Republic Steel Saved

40% IN COST...

3 OPERATIONS...

3 INSPECTIONS...

AND 1 BIG HEADACHE

Here's another case where Republic Carbon-Corrected Bar Stock replaced a carburizing steel.

Before they switched to Republic Carbon-Corrected Steel Bar Stock for automobile fan shafts, Schwitzer-Cummins Company had been carburizing the steel shafts after machining. This ran up costs, created the headache of carburizing and inspecting, tempering and inspecting, cleaning and inspecting, and finally straightening warped shafts and inspecting.

The Schwitzer-Cummins metallurgist called on our Republic 3-Dimension Metallurgical team... the Field Metallurgist, backed up at home by the Laboratory and Mill Metallurgists. The decision was made to change over to Republic

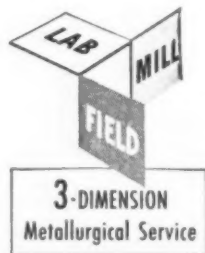
Carbon-Corrected AISI-C 1144 Bars. Now, induction hardening and inspection takes the place of the previous 8-step procedure. No warped shafts to straighten, and a better fan shaft that will last longer in your car or truck. Cost is reduced up to 40%.

The help our Republic 3-Dimension Metallurgical Service gave to Schwitzer-Cummins metallurgists is also available to you. It can help you make better products at lower cost. When shall we call?

REPUBLIC STEEL CORPORATION

Alloy Steel Division • Massillon, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.



Republic COLD DRAWN
ALLOY STEEL BARS



Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

Market Briefs and Bulletins

Pass-Throughs—Wider use of cost pass-throughs by fabricators of steel, copper, or aluminum now is expected after Dec. 20. On that date, Amend. 3 to General Overriding Reg. 35 removes a restriction which barred a manufacturer from receiving a price adjustment covering higher cost of one metal if he previously had obtained an adjustment for increased cost of another metal. Amend. 3 gives the producer the right to get an adjustment for increased costs of any metal covered by specified metals regulations.

More Freight Cars—Reflecting the increasing availability of steel, the nation's railway car builders delivered 5929 new domestic freight cars during November. This figure is far below the 9824 cars delivered in November, 1951, and short of the 10,000-car-month goal set by Defense Transportation Administration as the minimum production needed to keep freight transit from breaking down.

Steelmaking Record — Steelmaking furnaces produced 9,446,000 tons of ingots and steel for castings during November. This is the largest output ever attained during November and the second largest for any month, reports American Iron & Steel Institute.

Pay Hike—Pay increases have been granted 30,000 employees of Douglas Aircraft Co., Santa Monica, Calif. Coupled with wage and salary adjustments recently agreed upon for workers represented by the International Assn. of Machinists (AFL) the increase will raise the annual payroll for the company's 60,000 workers by \$7 million. Salary negotiations with the company's 2600 engineers have reached an impasse. These employees did not share in the recent increases.

Blown In—Pittsburgh Coke & Chemical Co. blew in its new \$8 million blast furnace at Neville Island, Pa., last week. The new 22-ft hearth furnace will add 300,000 tons yearly to the company's pig iron capacity. This brings total capacity to 800,000 tons.

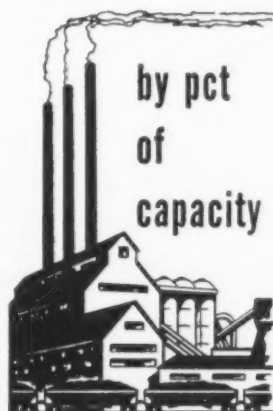
Back in Production—A furnace at Mystic Iron Works, Everett, Mass., which was under repair for more than a month will be back on blast during the week of Jan. 18. Because December pig iron shipments will deplete inventories and since January production will be limited, the company says "it will be necessary to apportion the available tonnage as equitably as possible."

Dividends Up—Cash dividend payments by corporations issuing public reports amounted to \$249 million in November. This is a 2 pct increase over the same month a year ago, reports Office of Business Economics, U. S. Dept. of Commerce. Yearly total of dividend payments is expected to exceed last year's level by a little less than 3 pct.

Double Production Rate—Within the past 30 days, Ryan Aeronautical Co., San Diego, has received \$6 million in new orders. General Electric has placed orders worth \$2 million for J-47 jet components. Douglas Aircraft and Ford Motor Co. have each placed \$1 million orders. Ryan's rate of production, now double last year's pace, is at its highest level since World War II.

Ford for Sale—Publication of Ford Motor Co.'s profits, earnings and sales, the first such financial statement in the company's history, strengthened rumors that Ford stock will eventually be placed on the market.

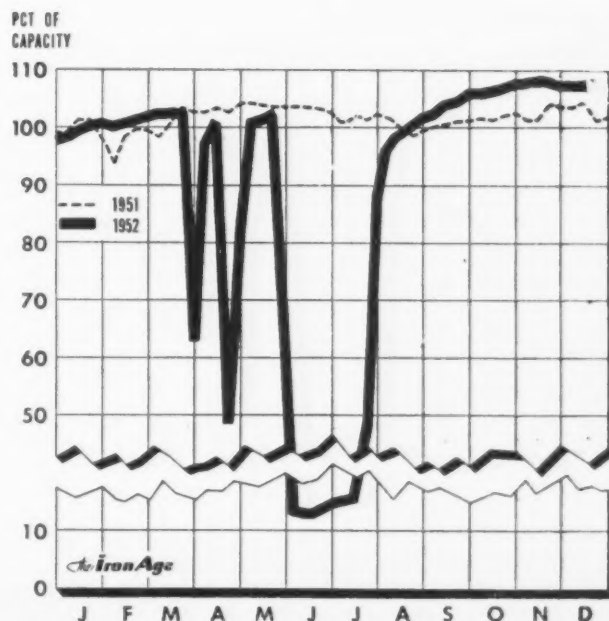
STEEL OPERATIONS



District Operating Rates

District	Week of Dec. 14	Week of Dec. 7
Pittsburgh	106.0	107.0
Chicago	109.0	108.5
Valley	105.0	104.0*
Philadelphia	102.0	100.5*
West	107.0	113.0*
Buffalo	106.5	
Cleveland	108.0	103.5
Detroit	106.0	106.0
Wheeling	101.0	101.0
Birmingham		
(South)	109.0	106.0
South Ohio River	93.0	93.0
St. Louis	96.0	96.0
East	92.0	93.5*
Aggregate	106.0	105.5

Beginning Jan. 1, 1953, operations are based on annual capacity of 108,587,670 net tons.
* Revised



Nonferrous Markets

Olin May Settle In West Virginia

Reports say Olin Industries will build its 110,000-ton aluminum plant in West Virginia, using coal residue for power . . . Power picture brighter in South—By R. L. Hatschek.

Conflicting reports have been circulating about the possible or probable location of the Olin Industries, Inc., aluminum smelter. The plant is scheduled under the government's requested third round expansion of 200,000 tons annual capacity and will be capable of 110,000 tons annual production.

One report had it that the plant would be situated in West Virginia on the Monongahela River, near Morgantown. Electricity, according to this source, would be generated by a plant burning char, a coal residue. This may well tie in with the announcements made by Sen. Harley M. Kilgore in July (See THE IRON AGE, July 3, p. 158).

Denial — Yet another report carried, in effect, a denial that anything that firm had been arrived at. It was brought out that the plant's location was one of Olin's prime considerations at the moment, with the power source being the main consideration in the decision.

But it seems unlikely that the site has not already been chosen. After all, the company had to make various rather specific cost estimates before proposals could be laid before the Washington planners for approval. Despite the government desire to get newcomers into the picture, a sound proposal is required.

Others, Too — Wheland Co. is right in the thick of things on the third round expansion. Talk has it this firm has a bid in for 85,000 tons of the 90,000-ton third round leftovers. But financing might prove troublesome. It seems Wheland wanted some government aid other than fast tax write-off but was turned down. New proposals are being worked up.

Harvey Machine Co. is trying to raise funds for its proposed \$45 million plant to be situated at The Dalles, Ore. This plant would have a capacity of about 45,000 to 55,000 tons, using power from the McNary Dam. This would push the third round beyond the 200,000-ton goal but it's felt the government wouldn't object to that as long as the new facilities belong to new producers.

Production — Power shortages continued to carve big holes in aluminum output during October. Production for the month totaled 77,312 tons as compared to 76,882 tons in September. That doesn't look too bad—but it could have been as much as 20,000 tons higher had it not been for dry weather. Shipments of aluminum wrought products showed a big jump in October, totaling 91,919 tons compared to 82,865 tons for the prior month.

The possibility came through and Aluminum Co. of America was able

to get the second Wenatchee potline into operation last week (See THE IRON AGE, Dec. 11, p. 200). Power has been switched over from Rock Island Dam to get this second line going. Snow and rain in the Southeast have brightened the picture there but heavy losses continue in the other end of the country.

Boost Nickel, Monel — Rolled nickel, regular Monel and Inconel mill prices have been given a 2.5¢ per lb upward push by International Nickel Co.'s Huntington, W. Va., rolling mill. New prices (see p. 178 for new list) went into effect on Monday. The hike resulted from increased plant costs and followed a wage boost allowed on Nov. 20 which is retroactive to July.

Quicksilver Higher — The \$15 per flask hike in the Spanish mercury price a month ago plus extremely tight supplies in this country has resulted in a general climb with the latest move being a \$2 jump to \$212 to \$214 last week. In London there are rumors of further hikes by the Spanish or Italian (more likely both) producers. Talk has it the next move would be at least \$8 per flask.

Steady, Waiting—The zinc market has been displaying what almost seems a lack of interest by consumers. But it isn't so. They just want to wait until the New Year rolls around to see what will happen on the London Metal Exchange. The quiet has been deceptive since latent demand is fairly high and the outlook is for even greater demand next year.

Expectations in Britain are for a much lighter impact on zinc prices than was true of lead when it was freed. A large share of government holdings are expected to go into the British stockpile. Liquidation of the remainder should be much more cautious in view of the trade complaints on lead. The fact that lead prices are now higher than zinc will also be a deterrent to steep diving of the zinc price.

NONFERROUS METAL PRICES

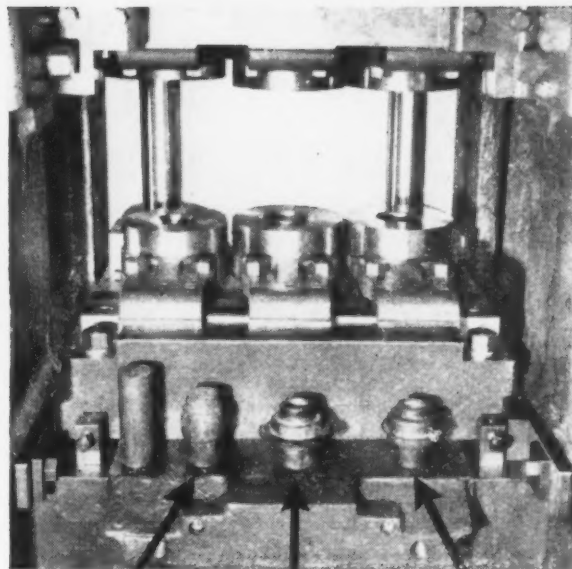
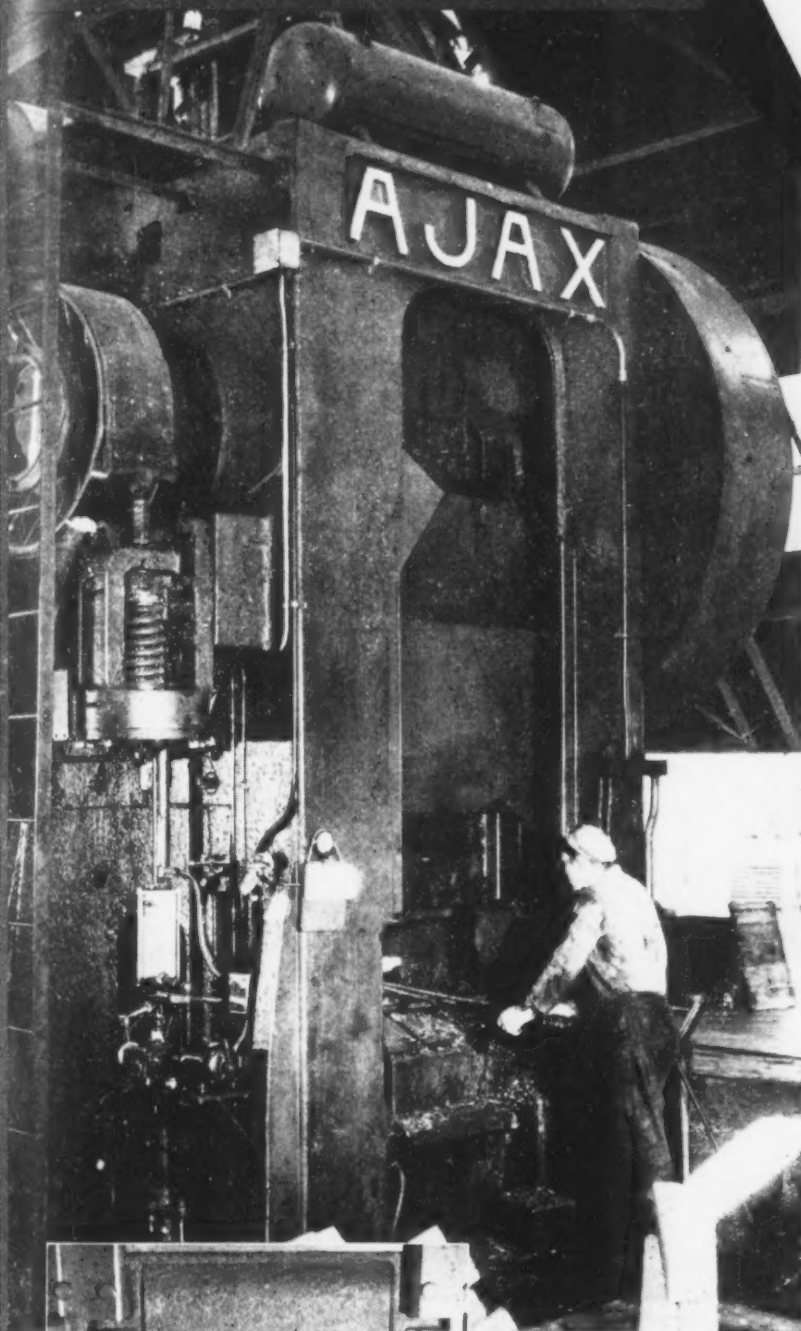
	Dec. 10	Dec. 11	Dec. 12	Dec. 13	Dec. 15	Dec. 16
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	\$1.21½	\$1.21½	\$1.21½	.....	\$1.21½	\$1.21½*
Zinc, East St. Louis	12.50	12.50	12.50	12.50	12.50	12.50
Lead, St. Louis	13.80	13.80	13.80	13.80	13.80	13.80

Note: Quotations are going prices.

*Tentative.

FORGED IN

AJAX PRESSES

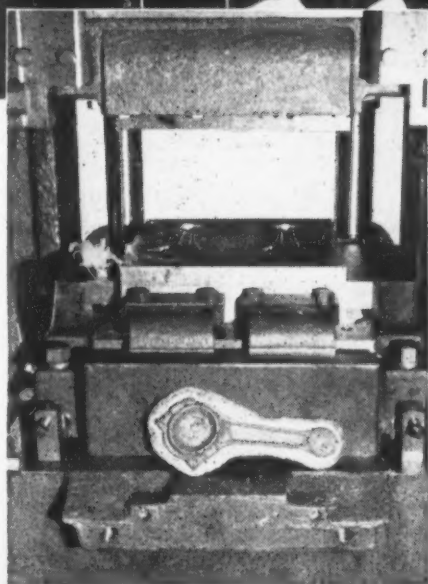


BUSTER
OPERATION

FINISHED
FORGING

BLOCKER
OPERATION

The progressive forging operations necessary for forming gear blanks for heavy trucks are shown in the foreground. Above, the dies mounted in a 1600 ton press, are in the following order: buster die on the left, blocker die on right and the finish forge die in the center. Each operation is shown in front of the die it is formed in.



Shown here are the dies and bolsters mounted in a 1600 ton press. The product, a heavy automotive connecting rod, is pictured in the foreground.

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WRITE FOR BULLETIN 75 B

Nonferrous Prices

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 20,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 31.6¢; 4S, 41S-O, 33.0¢; 52S, 35.8¢; 24S-O, 24S-OAL, 44.5¢; 75S-O, 75S-OAL, 41.9¢; 0.081 in., 2S, 3S, 31.8¢; 4S, 61S-O, 35.2¢; 52S, 37.4¢; 24S-O, 24S-OAL, 35.8¢; 75S-O, 75S-OAL, 43.9¢; 0.032 in., 2S, 3S, 34.5¢; 4S, 61S-O, 39.0¢; 52S, 41.8¢; 24S-O, 24S-OAL, 48.3¢; 75S-O, 75S-OAL, 54.8¢.

Plate 1/2 in. and heavier: 2S-F, 3S-F, 29.7¢; 4S-F, 31.7¢; 52S-F, 33.4¢; 61S-O, 32.3¢; 24S-O, 24S-OAL, 34.0¢; 75S-O, 75S-OAL, 40.7¢.

Extruded Solid Shapes: Shape factors 1 to 5, 35.5¢ to 77.2¢; 12 to 14, 36.2¢ to 93.5¢; 24 to 26, 35.7¢ to 11.22¢; 36 to 38, 45.9¢ to 11.79¢.

Red, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 39.4¢ to 35.1¢; cold-finished, 0.375 to 3 in., 2S-F, 3S-F, 42.5¢ to 36.5¢.

Screw Machine Stock: Rounds, 11S-Ts, 1/2 to 11/32 in., 56.2¢ to 44.1¢; 3/4 to 1 1/2 in., 43.6¢ to 41.0¢; 1 9/16 to 3 in., 40.4¢ to 37.5¢; 17S-Ts, 1.6¢ per lb lower. Base 5000 lb.

Drawn Wire: Coiled, 0.061 to 0.374 in., 2S, 41.5¢ to 30.5¢; 52S, 56.4¢ to 36.8¢; 56S, 53.6¢ to 44.1¢; 17S-T4, 56.7¢ to 39.4¢; 61S-T4, 50.9¢ to 35.9¢.

Extruded Tubing: Rounds, 63S-T6, OD in in.: 1 1/4 to 2, 35.9¢ to 56.7¢; 2 to 4, 35.2¢ to 47.8¢; 4 to 6, 35.7¢ to 43.6¢; 6 to 9, 36.2¢ to 45.7¢.

Roofing Sheet: Flat, 0.019 in. x 28 in., per sheet, 72 in., \$1.199; 96 in., \$1.598; 120 in., \$1.997; 144 in., \$2.398. 0.24 in. x 28 in., 72 in., \$1.448; 96 in., \$1.931; 120 in., \$2.414; 144 in., \$2.897. Coiled sheet: 0.019 in. x 28 in., 29.8¢ per lb; 0.024 in. x 28 in., 28.2¢ per lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FSI-O, 1/4 in., 63¢; 3/16 in., 65¢; 1/2 in., 67¢; B & S Gage 10, 68¢; 12, 72¢. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., 1/4 to 0.311 in., 74¢; 1/2 to 1 in., 57.5¢; 1 1/4 to 1.749 in., 53¢; 2 1/4 to 5 in., 48.5¢. Other alloys higher. Base up to 1/2 in. diam, 10,000 lb; 1/2 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 8.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 69.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 lb, 10,000 lb; 1/2 to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057; 1/4 in. to 5/16, \$1.40; 5/16 to 3/4, \$1.26; 3/4 to 1, \$1.12; 1 to 2 in., 76¢; 0.165 to 0.219, 9¢ to 3¢, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1 1/2 in., 10,000 lb; 1 1/2 in. to 8 in., 20,000 lb; 8 in. and larger, 30,000 lb.

Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$6; Forgings, \$6.

Nickel and Monel

(Base prices, f.o.b. mill)

"A" Nickel Monel
Sheets, cold-rolled 79 1/2 63
Strip, cold-rolled 85 1/2 66
Rods and bars 75 1/2 61
Angles, hot-rolled 75 1/2 61
Plates 77 1/2 62
Seamless tubes 108 1/2 96
Shot and blocks 54 1/2

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	45.52		45.12
Copper, h-r		41.37	
Copper, drawn		42.62	
Low brass	42.34	42.03	
Yellow brass	40.17	39.88	
Red brass	43.10	42.79	
Naval brass	44.72	38.78	40.04
Lead brass			38.02
Comm. bronze	44.39	44.08	
Mang. bronze	48.44	42.83	43.89
Phos. bronze	64.72	64.97	
Muntz metal	42.69	38.25	39.50
NI silver, 10 pct	51.96	54.18	

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed 20.00
Aluminum pig 19.00
Antimony, American, Laredo, Tex. 34.50
Beryllium copper, 3.75-4.25% Be. \$1.595
Beryllium aluminum 5% Be, Dollars per lb contained Be \$69.00
Bismuth, ton lots \$2.25
Cadmium, del'd \$1.50 to \$2.00
Cobalt, 97-99% (per lb) \$2.40 to \$2.47
Copper, electro, Conn. Valley 24.50
Copper, Lake, delivered 24.625
Gold, U. S. Treas., dollars per oz. \$35.00
Indium, 99.8%, dollars per troy oz. \$2.25
Iridium, dollars per troy oz. \$2.00
Lead, St. Louis 13.80
Lead, New York 14.00
Magnesium, 99.3+%, f.o.b. Freeport, Tex., 10,000 lb. 24.50
Magnesium, sticks, 100 to 500 lb. 42.00 to 44.00
Mercury, dollars per 76-lb. flask, f.o.b. New York \$212 to \$214
Nickel electro, f.o.b. N. Y. warehouse \$9.55
Nickel oxide sinter, at Copper Creek, Ont., contained nickel 52.75
Palladium, dollars per troy oz. \$24.00
Platinum, dollars per troy oz. \$90 to \$93
Silver, New York, cents per oz. 83.25
Tin, New York \$1.21 1/2
Titanium, sponge \$5.00
Zinc, East St. Louis 12.50
Zinc, New York 13.33
Zirconium copper, 50 pct \$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot
No. 115 27.25
No. 120 26.75
No. 123 26.25
80-10-10 ingot
No. 305 33.00
No. 315 30.50
88-10-2 ingot
No. 210 41.50
No. 215 40.00
No. 245 34.50
Yellow ingot
No. 405 23.25
Manganese bronze
No. 421 30.50

Aluminum Ingot

(Cents per lb, 100,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper, max. 20.6
0.60 copper, max. 20.4
Piston alloys (No. 123 type) 20.5
No. 12 alum. (No. 2 grade) 19.6
108 alloy 20.6
195 alloy 20.8
13 alloy (0.60 copper max.) 20.8
ASX-679 20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97 1/2% 18.80
Grade 2—92-95% 18.60
Grade 3—90-92% 18.40
Grade 4—85-90% 18.20

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper
Cast, oval, 15 in. or longer 37.34
Electrodeposited 33.34
Flat rolled 38.34
Forged ball anodes 43
Brass, 80-20
Cast, oval, 15 in. or longer 34.34
Zinc, oval 26 1/2
Ball, anodes 25 1/2
Nickel, 99 pct plus
Cast 76.00
Rolled, depolarized 77.00
Cadmium \$2.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn 97 1/2

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum 63
Copper sulfate, 99.5 crystals, bbl. 12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed 27 1/2
Nickel chloride, 375 lb drum 27 1/2
Silver cyanide, 100 oz lots, per oz 67 1/2
Sodium cyanide, 96 pct domestic 200 lb drums 19.25
Zinc cyanide, 100 lb drum 47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1/2¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21 1/2	20 3/4
Yellow brass	19 1/2	17 1/2
Red brass	20 1/4	19 1/2
Comm. bronze	20 1/4	19 1/2
Mang. bronze	18 1/2	17 1/2
Brass rod ends	18 1/2	

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25
Radiators	14.75

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Roller brass	15.50
Brass pipe	16.50
Radiators	14.75

	Aluminum	
Mixed old cast	9	— 9 1/2
Mixed new clips	10	— 11
Mixed turnings, dry	9	— 9 1/2
Pots and pans	8 1/2	— 9

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	18 1/2	— 19 1/2
No. 2 heavy copper and wire	17	— 17 1/2
Light copper	15 1/2	— 16
New type shell cuttings	15 1/2	— 16
Auto radiators (unsweated)	14	
No. 1 composition	17 1/2	— 18
No. 1 composition turnings	17	— 17 1/2
Unlined red car boxes	16 1/2	— 17
Cocks and faucets	15	— 15 1/2
Mixed heavy yellow brass	11 1/2	— 12
Old rolled brass	14 1/2	— 15
Brass pipe	15 1/2	— 16
New soft brass clippings	16	— 16 1/2
Brass rod ends	15 1/2	— 16
No. 1 brass rod turnings	15	— 15 1/2

Aluminum

Alum. pistons and struts	6 1/2	— 7
Aluminum crankcases		7 1/2
2S aluminum clippings		10 1/2
Old sheet and utensils		7 1/2
Borings and turnings	6	— 6
Misc. cast aluminum	7 1/2	— 8
Dural clips (24S)		7 1/2

Zinc

New zinc clippings	7	— 7 1/2
Old zinc	5	— 5 1/2
Zinc routings	3	— 3 1/2
Old die cast scrap	4	— 4 1/2

Nickel and Monel

Pure nickel clippings	35	— 36
Clean nickel turnings	35	— 36
Nickel anodes	35	— 36
Nickel rod ends	35	— 36
New Monel clippings	28	— 29
Clean Monel turnings	20	— 21
Old sheet Monel	28	— 29
Nickel silver clippings, mixed	13	— 14
Nickel silver turnings, mixed	12	— 13

Lead

Soft scrap, lead	10 1/2	— 11 1/2
Battery plates (dry)	5.90	— 6.15
Batteries, acid free		4.15

Magnesium

Segregated solids	15	— 16
Castings	14	— 15

Miscellaneous

Block tin		100
No. 1 pewter		70
No. 1 auto babbitt	55	— 60
Mixed common babbitt	13 1/2	— 14
Solder joints		17 1/2
Siphon tops		60
Small foundry type	18	— 18 1/2
Monotype	13 1/2	— 14
Lino. and stereotype	12 1/2	— 13
Electrotype	10 1/2	— 11
Hand picked type shells	8 1/2	— 9
Lino. and stereo. dross		5
Electro dross		4 1/2

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Iron and Steel Scrap Markets

How Serious Is Low Dealer Yard Intake?

More concern would be shown were it not for large mill stockpiles . . . Scrap men admit that a tight scrap market is possible . . . How much scrap can industry turn out unaided?

Were it not for large steel mill inventories of scrap iron and steel much more concern would be turned to slow dealer yard intake. Many dealers find it difficult pinning all the blame for poor yard receipts on the seasonal slowup. How much trouble develops from this grassroots source of scrap will be known this winter. This is one of the factors offsetting high mill inventories.

There is some buzzing among the trade on Washington's warning of a possible scrap shortage. Many scrap men freely admit that a tight market is possible but they won't concede a truly serious shortage is possible. What kind and how stormy a shortage does Washington mean, is one question asked?

There are other scrap men who believe huger steel capacity operating at a continued brisk pace may put the squeeze on collections. It's estimated that the industry can collect more than 30 million gross tons of scrap under its own power. If much more than that is needed it means another scrap drive.

Pittsburgh—Steel producers feel government fears of a possible scrap shortage in 1953 are justified to a certain extent. They point out that although we are not in all-out war the defense program is likely to continue at a high rate. These requirements, along with heavy civilian demand, will keep ingot rates up through first half of 1953. An uncertain factor—the weather—could reverse current optimism over high inventories. A prolonged spell of bad weather would result in sharp reduction of scrap stocks. First sign of trouble would reactivate government and industry scrap drives.

Chicago—Steelmaking scrap grades were a source of greater optimism here this week. Talk of a break in Number 2 bundles seemed to have quieted. One broker was reported

buying well into January at present prices. On east the market continued down. Electric furnace continued rather slow but there seemed to be a slight revival of interest in openhearth though this was not reflected in any appreciable price climb. Dealer shipments continued down, one possible source of the stronger feeling in openhearth, and some brokers indicated a feeling that mill stockpiles were sinking.

Philadelphia—Reduced production of cast iron soil pipe in this district has further cut demand on cast grades of scrap. There are practically no takers for unstripped motor blocks, which are off \$1 from the high side of the spread. Cupola cast is also \$1 lower, now priced at \$44 to \$45, and talk is heard of even lower prices possible. The trade is virtually unanimous in feeling there will be no shortage of scrap this winter despite Washington attitudes.

New York—There is a slight year-end dip in demand for most grades. Fairless Works buying is reportedly picking up. Blast furnace grades are moving fairly well but things could be better in this grade, the trade says. Dealer receipts are reported way down. If anything, cast grades were softer. Scrap people admit that if steelmaking operations continue at a high pitch a tight scrap market is possible.

Detroit—Inventories are still not up to a satisfactory level. Ford is a prominent exception with a very good inventory. Openhearth and electric furnace grades are consequently strong. Blast furnace grades are a little weak, but can be placed often enough to keep ceiling price from being punctured. Both dealer and industrial scrap are moving well.

Cleveland—Demand for openhearth and electric furnace is keeping the market firm. Some dealers complain about slow yard receipts but most are unwilling to lay down large ton-

nages in yards until after first of the year. Opinion on possibility of a scrap shortage is divided. Some think market will be firm through first half while others believe a shortage by February "very possible."

Birmingham—Southern scrap dealers report lowest inventories in several years. What they get is going to northern mills, with only one southern mill in the market at this time. The largest buyer in the district has taken a small amount of blast furnace scrap in the past week, but says it will be out of the market for openhearth until the first of the year. Large purchases made 2 months ago have not all been accepted, but deliveries probably will be completed in a couple of weeks.

Cincinnati—Dealers here expect the next 2 weeks to be the quietest within the past 2 years. No price changes are expected because trading is at a year-end standstill. Most orders have already been covered but electric furnace is still in demand. Shipments are no problem so far because of favorable weather and availability of cars.

Boston—Scrap story for this week is continuation of good demand for high grade openhearth and electric furnace steel. Feeling in the cast grades was strengthened last week by slightly higher demand for good heavy breakable machinery, resulting in a slight increase to \$40 to \$40.50 per gross ton. The gap has closed upward on mixed cupola to \$36.50 to \$37.

Buffalo—Mills were making sharp inroads on reserve scrap stocks at the start of this week as heavy snows hampered dealers' yard operations. Dealers also reported a sharp falling off in recent receipts. It is estimated that mills' stockpiles are now down to about 40 days. Two more boat loads of scrap arrived from Upper Lake ports during the week with approximately 10,000 tons.

West Coast—The market continued dull along the West Coast last week. Volume was slightly below normal with no major price changes. In cast, however, No. 1 cupola dropped 50¢ to \$42.50 in Seattle and mixed yard cast was going for \$41.00.

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Steel Scrap • Ostend & Paca Sts., Baltimore 30, Md.

Scrap Prices

Iron and Steel **SCRAP PRICES** (Maximum basing point prices, per gross ton, as set by OPS in CPR 5 and amendments.)

GRADES	OPS No.	Basing Points															
		Pittsburgh	Johnstown	Brackenridge	Butler	Midland	Monessen	Sharon	Youngstown	Canton	Steubenville	Warren	Wheaton	Cleveland	Buffalo	Cincinnati	Middletown
No. 1 bundles	1	\$44.00	\$44.00	\$44.00	\$44.00	\$44.00	\$44.00	\$44.00	\$44.00	\$44.00	\$44.00	\$44.00	\$44.00	\$44.00	\$44.00	\$44.00	\$44.00
No. 1 busheling	2	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00
No. 1 heavy melting	3	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00
No. 2 heavy melting	4	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00
No. 2 bundles	5	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00	34.00
Machine shop turnings	6	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00
Mixed borings and turnings	7	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00
Shoveling turnings	8	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00
Cast iron borings	10	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00	38.00
No. 1 chemical borings	26	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00
Forge crops	11	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50	51.50
Bar Crops and plate	12	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00
Punchings and plate	14	46.50	46.50	46.50	46.50	46.50	46.50	46.50	46.50	46.50	46.50	46.50	46.50	46.50	46.50	46.50	46.50
Electric furnace bundles	15	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00
Cut struc., plate, 3 ft and less	16	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00
Cut struc., plate, 2 ft and less	17	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00
Cut struc., 1 ft and less	18	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Foundry steel, 2 ft and less	20	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00	44.00
Foundry steel, 1 ft and less	21	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00
Heavy trimmings	24	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00
No. 1 RR heavy melting	RR 1	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00	46.00
Scrap rails, random lengths	RR 14	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
Scrap rails, 3 ft and less	RR 16	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00
Scrap rails, 2 ft and less	RR 17	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00	52.00
Scrap rails, 18 in. and less	RR 18	54.00	54.00	54.00	54.00	54.00	54.00	54.00	54.00	54.00	54.00	54.00	54.00	54.00	54.00	54.00	54.00
Revolving rails	RR 15	53.00	53.00	53.00	53.00	53.00	53.00	53.00	53.00	53.00	53.00	53.00	53.00	53.00	53.00	53.00	53.00
Uncut tires	RR 20	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
Cut tires	RR 21	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00
Cut bolsters and side frames	RR 23	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00
RR specialties	RR 24, 28, 29	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00
Solid steel axles	RR 25	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00
No. 3 steel wheels	RR 27	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00	51.00
Unassorted	RR 35	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00

Cast Scrap Ceilings

Prices set by CPR 5, OPS

(F.o.b. all shipping points)

Grades	OPS No.	Price
Cupola cast	1	\$49.00
Charging box cast	2	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron carwheels	9	47.00
Malleable	10	55.00
Drop broken mach'y cast	11	52.00

Ceiling price of clean cast iron foundry runout or prepared cupola drops is 75 pct of corresponding grade.

Under Ceiling Scrap Prices

Pittsburgh

Machine shop turnings	\$32.00
No. 1 machinery cast	52.00
Heavy breakable cast	45.00
Malleable	55.00

Chicago

Low phos. forge crops	\$50.00 to \$51.00
Cut struc., plate, 3 ft & less	44.50 to 45.50
Cut struc., plate, 2 ft & less	46.50 to 47.50
Cut struc., plate, 1 ft & less	47.50 to 48.50
Machine shop turnings	30.00 to 31.50
Mixed borings, turnings	34.00 to 35.50
Shoveling turnings	34.00 to 35.50
Cast iron borings	34.00 to 35.50
Cupola cast	43.00 to 44.00
Heavy breakable cast	38.50 to 40.00
Malleable	47.00 to 48.00
Stove plate	40.00 to 41.00
Clean auto cast	44.00 to 45.00
Charging box cast	41.00 to 42.00
Drop broken mach'y	46.00 to 47.00
Unstripped motor blocks	35.00 to 37.00
Cast iron brake shoes	40.00 to 41.00

Philadelphia Area

Clean cast chem. borings	\$27.00 to \$38.00
Cupola cast	44.00 to 45.00
Unstripped motor blocks	34.00 to 35.00
Charging box cast	45.00 to 46.00

Cleveland

Cast iron borings	\$34.00 to \$34.50
Stove plate	45.00 to 46.00
Malleable	51.00 to 52.00

Youngstown

Cast iron borings	\$35.00 to \$35.50
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Buffalo

No. 1 machinery cast	\$49.00 to \$50.00
No. 1 cupola cast	46.00 to 47.00

Birmingham

Shoveling turnings	\$30.00 to \$32.00
Cast iron borings	30.00 to 32.00
No. 1 Cupola cast	46.00 to 47.00
Stove plate	41.50 to 42.50
Charging box cast	36.00 to 38.00
Heavy breakable	36.00 to 38.00
Unstripped motor blocks	39.00 to 40.00

New York

Brokers' Buying prices per gross ton, on cars:	
Clean cast chem. borings	\$29.00 to \$30.00
No. 1 machinery cast	47.00 to 49.00
Mixed yard cast	39.00 to 41.00
Charging box cast	44.00 to 45.00
Heavy breakable cast	44.00 to 45.00
Unstripped motor blocks	31.00 to 32.00

Boston

Brokers' Buying prices per gross ton, on cars:	
Clean cast chem. borings	\$30.00 to \$31.00
Mixed cupola cast	36.50 to 37.00
Heavy breakable cast	40.00 to 40.50
Stove plate	36.00 to 37.00
Unstripped motor blocks	30.00 to 30.25

Detroit

Brokers' Buying prices per gross ton, on cars:

No. 1 cupola cast	\$48.00
Heavy breakable cast	\$43.00 to 44.00
Stove plate	43.00 to 44.00
Cast iron brake shoes	39.00 to 40.00

Cincinnati

No. 1 cupola cast	\$49.00
Stove plate	46.00
Drop broken cast	\$51.00 to 52.00
Malleable	49.00 to 50.00

St. Louis

Charging box cast	\$43.00 to \$44.00
No. 1 cupola cast	48.00 to 49.00
Heavy breakable cast	41.00 to 42.00
Unstripped motor blocks	38.00

San Francisco

No. 2 heavy melting	\$29.00
No. 2 bundles	29.00
Machine shop turnings	14.00
No. 1 cupola cast	42.00

Los Angeles

No. 2 heavy melting	\$29.00
No. 2 bundles	29.00
Machine shop turnings	14.00
Shoveling turnings	20.00
No. 1 cupola cast	44.00

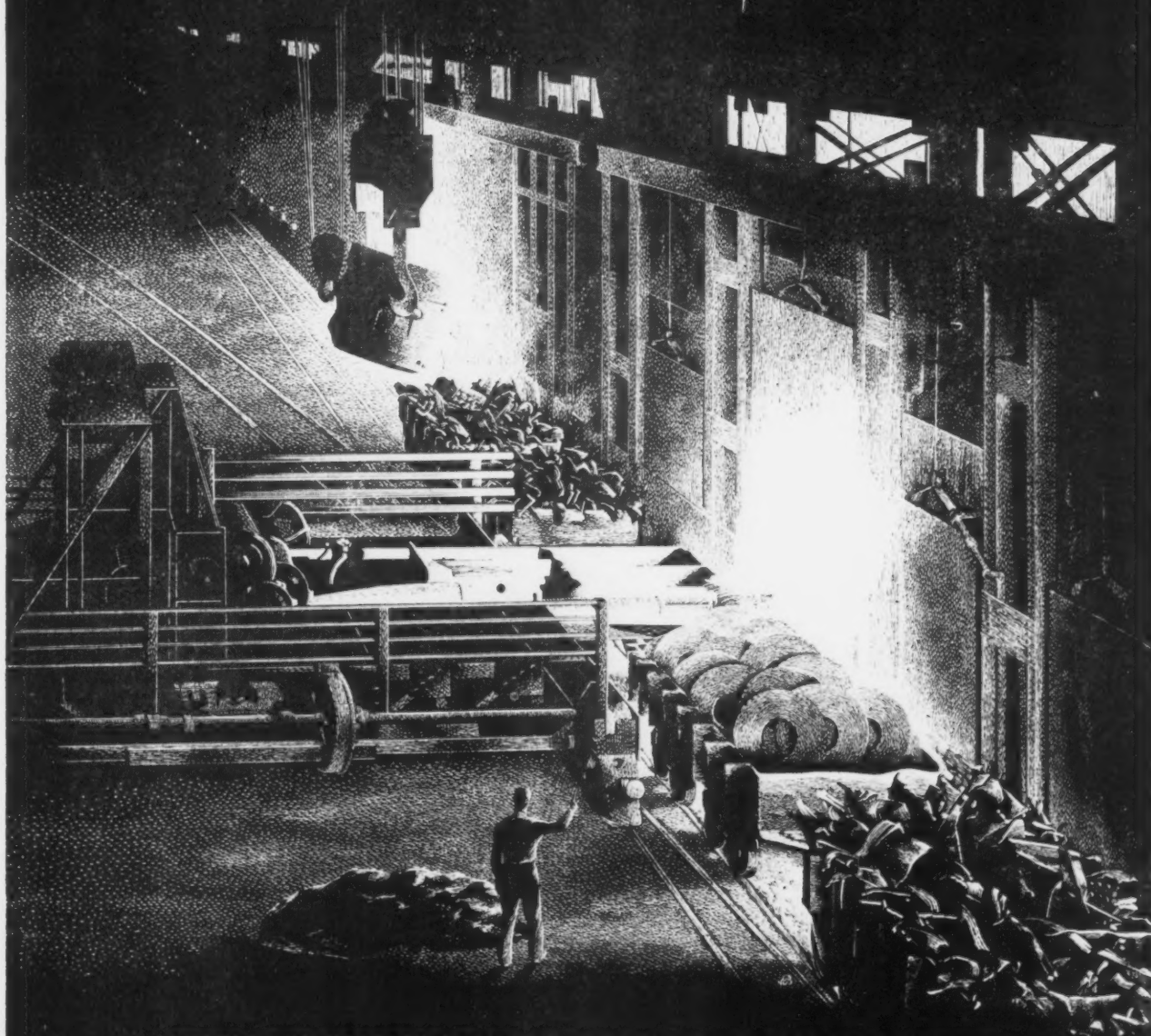
Seattle

No. 2 bundles	\$29.00
No. 1 cupola cast	42.50
Mixed yard cast	41.00

Hamilton, Ont.

No. 1 hvy. melting	\$35.50
No. 1 bundles	35.50
No. 2 bundles	35.00
Mechanical bundles	33.50
Mixed steel scrap	31.50
Mixed borings, turnings	32.50
Rails, remelting	35.50
Rails, rerolling	44.80
Bushelings	30.50
Bush, new fact, prep'd	33.50
Bush, new fact, unprep'd	32.50
Short steel turnings	32.50
Cast scrap	50.00

for the purchase or sale of **scrap**



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LEADERS IN IRON AND STEEL SCRAP SINCE 1869

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Dec. 16 1952	Dec. 9 1952	Nov. 18 1952	Dec. 18 1951
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.775¢	3.775¢	3.775¢	3.60¢
Cold-rolled sheets	4.575	4.575	4.575	4.35
Galvanized sheets (10 ga.)	5.075	5.075	5.075	4.80
Hot-rolled strip	3.725	3.725	3.725	3.50
Cold-rolled strip	5.20	5.20	5.20	4.75
Plate	3.90	3.90	3.90	3.70
Plates wrought iron	9.00	9.00	9.00	7.85
Strains C-R strip (No. 302)	36.75†	36.75†	36.75†	36.75
Tin and Ternplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$8.95	\$8.95	\$8.95	\$8.70
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.40
Special coated mfg. ternes	7.75	7.75	7.75	7.50
Bars and shapes: (per pound)				
Merchant bars	3.95¢	3.95¢	3.95¢	3.70¢
Cold finished bars	4.925	4.925	4.925	4.55
Alloy bars	4.675	4.675	4.675	4.30
Structural shapes	3.85	3.85	3.85	3.65
Stainless bars (No. 302)	\$15.0†	\$15.0†	\$15.0†	\$15.0
Wrought iron bars	10.05	10.05	10.05	9.50
Wire: (per pound)				
Bright wire	5.225¢	5.225¢	5.225¢	4.85¢
Rails: (per 100 lb)				
Heavy rails	\$3.775	\$3.775	\$3.775	\$3.60
Light rails	4.25	4.25	4.25	4.00
Semifinished Steel: (per net ton)				
Re-rolling billets	\$59.00	\$59.00	\$59.00	\$56.00
Slabs, re-rolling	59.00	59.00	59.00	56.00
Forging billets	70.50	70.50	70.50	66.00
Alloy blooms, billets, slabs	76.00	76.00	76.00	70.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.325¢	4.325¢	4.325¢	4.10¢
Skelp	3.55	3.55	3.55	3.35

† Add 4.7 pct to base and extras.

Composite: (per pound)

Finished steel base price 4.376¢ 4.376¢ 4.376¢ 4.181¢

	Dec. 16 1952	Dec. 9 1952	Nov. 18 1952	Dec. 18 1951
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$60.69	\$60.69	\$60.69	\$57.97
Foundry, Valley	55.00	55.00	55.00	52.50
Foundry, Southern, Cin'ti	58.93	58.93	58.93	55.58
Foundry, Birmingham	61.88	61.88	61.88	58.28
Foundry, Chicago†	55.00	55.00	55.00	52.50
Basic del'd Philadelphia	59.77	59.77	59.77	57.09
Basic, Valley furnace	54.50	54.50	54.50	52.00
Malleable, Chicago†	55.00	55.00	55.00	52.50
Malleable, Valley	55.00	55.00	55.00	52.50
Ferromanganese	226.25	226.25	226.25	186.25

† The switching charges for delivery to foundries in the Chicago district is \$1 per ton.

‡ Average of U. S. prices quoted on Ferroalloy pages.

Composite: (per gross ton)	\$55.26	\$55.26	\$55.26	\$52.72
Pig iron				
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$43.00*	\$43.00*	\$43.00*	\$43.00*
No. 1 steel, Phila. area	41.50*	41.50*	41.50*	41.50*
No. 1 steel, Chicago	41.50*	41.50*	41.50*	41.50*
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	41.15*
Low phos., Youngstown	46.50*	46.50*	46.50*	46.50*
No. 1 cast, Pittsburgh	49.00†	49.00†	49.00†	49.00†
No. 1 cast, Philadelphia	44.50	45.50	47.50	49.00†
No. 1 cast, Chicago	43.50	43.50	43.50	49.00†

* Basing pt., less broker's fee. † Shipping pt., less broker's fee.

Composite: (per gross ton)	\$42.00	\$42.00	\$42.00	\$42.00
No. 1 heavy melting scrap				
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$14.75	\$14.75	\$14.75	\$14.75
Foundry coke, prompt	17.75	17.75	17.75	17.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	24.50	24.50	24.50	24.50
Copper, Lake, Conn.	24.625	24.625	24.625	24.625
Tin, Straits, New York	\$1.21½†	\$1.21½*	\$1.21½	\$1.03
Zinc, East St. Louis	12.50	12.50	12.50	19.50
Lead, St. Louis	18.80	18.80	14.30	18.80
Aluminum virgin ingot	30.00	20.00	20.00	19.00
Nickel, electrolytic	59.58	59.58	59.58	59.58
Magnesium, ingot	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex.	34.50	34.50	34.50	50.00

† Tentative. * Revised.

Composite Price Notes

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Warehouse Price Notes

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over Alloy bars; 1000 to 999 lb. All others; 2000 to 999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1) 500 to 1499 lb, (2) 1500 to 8499 lb, (3) 6000 lb or over, (4) 450 to 1499 lb.

WARE-HOUSES

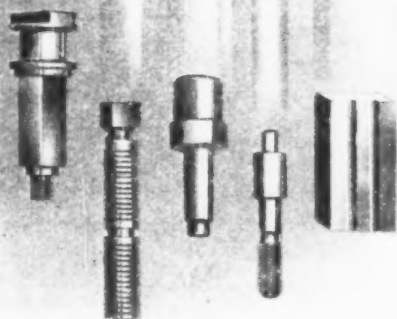
Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets		Strip		Plates		Shapes		Bars		Alloy Bars			
		Hot-Rolled	Cold-Rolled (15 ga)	Galvanized (10 ga)	Hot-Rolled	Cold-Rolled	Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As rolled	Cold-Drawn A 4140 Annealed		
Baltimore.....	\$.20	5.81	7.17	8.37-8.57	6.42	.....	6.30-6.47	6.41	7.18-7.43						
Birmingham.....	.15	5.80	6.65	7.70†	5.80	.....	6.10	5.95-5.80	8.25-8.40						
Boston.....	.20	6.48	7.35	8.54	6.55	8.50†	6.75	6.56	6.38-7.47	10.78	11.15				
Buffalo.....	.20	5.76	6.60	8.40	6.16	6.19	6.26	5.96	5.76-6.00	10.70	11.08	12.70	12.51-14.42		
Chicago.....	.20	5.80	6.65	8.41	6.21	.....	6.37	6.08	5.90-6.95		11.07		12.65		
Cincinnati.....	.15	5.81	6.65	8.00	5.83	.....	5.95	5.95	5.83-6.92		10.65		13.07		
Cleveland.....	.20	5.80	6.65	8.14	6.00	.....	6.12	6.28	5.89-6.90		10.79		12.79		
Denver.....		5.81	6.65	8.00	6.01	.....	6.17	6.28	5.89-6.90		10.79		12.79		
Detroit.....	.20	6.00	6.81	8.64	6.13	7.99	6.45	6.12	6.12-6.975	10.72	10.92	12.72	13.02		
Houston.....	.20	6.07	6.92	8.68	6.13	9.80	6.47	6.45	6.45-6.82	11.90	11.90		13.90		
Indianapolis.....	del'd	6.74	7.78	8.68	6.61	.....	6.83	6.66	6.82-9.00						
Kansas City.....	.20	6.79	7.79	8.68	6.75	.....	7.07	6.79	6.79-9.62						
Los Angeles.....	.20	6.47	7.31	8.50-8.72	6.51	8.07	6.62-6.67	6.62	6.50-7.57	11.15-11.90	11.45	13.13-13.43	13.43-14.18		
Memphis.....	.10	6.60	8.45	9.60	6.75	9.15	6.45	6.60	6.60-8.35						
Milwaukee.....	.20	6.56	.....	.....	6.60	.....	6.71	6.64	6.57-7.98						
New Orleans.....	.15	5.97	6.82	8.17	6.00	.....	6.12	6.12	6.83-7.67		10.82		12.62		
New York.....	.30	6.28	7.12	.....	6.32	.....	6.43	6.43	6.31-7.85						
Norfolk.....	.20	6.26	7.27	8.31†	6.56	9.53	6.60	6.39	6.59-7.50	10.74	11.04	12.74	13.04-13.27		
Philadelphia.....	.25	6.69	7.60	8.63	7.05	.....	7.19	6.70	6.89-7.53	10.98	11.28	12.97	13.04		
Pittsburgh.....	.20	7.10	.....	.....	6.81	.....	6.64	7.25	6.44	8.45			12.65		
Portland.....	.20	6.11	7.13	8.30	6.45	.....	6.24	6.17	6.42-7.45	10.57	10.79	12.74	12.79-13.04		
Salt Lake City.....	.20	6.38	7.92	8.79	7.45	.....	6.86	6.42	6.88-7.69	10.74	11.04		13.04		
San Francisco.....	.15	5.80	6.65	8.00	5.94	.....	6.00	5.95	5.83-6.66		10.65		12.65		
Seattle.....	.20	5.81	6.65	8.45	5.97	.....	6.00	5.95	5.83-6.90						
St. Louis.....	.20	7.60	9.15	10.05	7.60	.....	7.27	7.30	7.35-9.45						
St. Paul.....	.15	7.80	9.45	.....	7.65	.....	7.85	8.00	8.40						
		8.30	.....	10.90†	8.45	.....	7.85	8.00	8.40						
		6.90	8.20	9.60	6.75	9.25	6.75	6.50	6.65	8.40		12.05	14.60		
		7.16	8.83	9.80	7.14	.....	7.04	6.75	7.14-9.37		11.70		13.70		
		7.37	9.17	9.85	7.69	.....	7.20	6.89	7.24-9.42						
		6.10	6.94	8.30	6.14	9.73	6.35	6.35	6.13-6.96	10.65	10.95	12.65	12.95		
		6.30	7.83	6.60	6.60	6.33	7.40						
		6.47	7.31	8.66	6.50	6.61	6.61	6.49-7.32						

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COLD FINISHED STEELS**



Whether your equipment is yesterday's model or today's latest automatic, you can get more out of your machines by using B&L uniform-cutting Screw Stock and the engineering service that goes with it.

If your plant is being converted to emergency production of defense parts, you need to use a grade of steel that will develop the full capacity of the machine, and also satisfy the service requirements of the job.

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Defense Steel . . . be sure your
SCRAP goes back to the mills

BLISS & LAUGHLIN, INC.

GENERAL OFFICES: HARVEY, ILLINOIS

PLANTS: HARVEY, ILL. • BUFFALO, N. Y. • MANSFIELD, MASS.

SALES OFFICES IN ALL PRINCIPAL CITIES



STEEL PRICES

		INGOTS		BILLETS, BLOOMS, SLABS			PIPE SKELP	PIL-ING	SHAPES STRUCTURALS		STRIP			
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton			Carbon	Hi Str. Low Alloy	Hot rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy
EAST	Beithlehem, Pa.					\$76.00 B3			3.90 B3	5.80 B3				
	Buffalo, N. Y.			\$59.00 B3	\$70.50 B3, R3	\$76.00 B3, R3		4.675 B3	3.90 B3	5.80 B3	3.725 B3, R3	5.10 B3	5.70 B3	7.90 B3
	Claymont, Del.													
	Costesville, Pa.													
	Conschohocken, Pa.				\$77.50 A2	\$83.00 A2					4.125 A2		5.90 A2	
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.			\$59.00 B3	\$70.50 B3	\$76.00 B3			3.90 B3	5.80 B3	3.725 B3			
	Newark, N. J.													
	New Haven, Conn.											5.60 A5 5.85 D1		
	Phoenixville, Pa.								6.10 P2					
	Putnam, Conn.													
	Sparrows Pt., Md.										3.725 B3	5.10 B3	5.70 B3	7.90 B3
	Worcester, Mass.													
MIDDLE WEST	Trenton, N. J.											6.45 R4		
	Alton, Ill.										4.20 L1			
	Ashland, Ky.										3.725 A7			
	Canton-Massillon, Ohio				\$70.50 R3	\$76.00 R3 \$78.00 T5								
	Chicago, Sterling, Ill.			\$59.00 U1	\$70.50 U1, R3, W8	\$76.00 U1, R3, W8		4.675 U1	3.85 U1, W8	5.80 U1	3.725 A1, W8 4.725 N4	5.35 A1		
	Cleveland, Ohio				\$70.50 R3							5.10 A5, J3		7.45 J3
	Detroit, Mich.	\$54.00 R5	\$57.00 R5		\$73.50 R5	\$79.00 R5					4.025 G3 4.40 M2	5.30 G3 5.45 M2 5.60 D1 6.05 D2	6.30 G3	8.15 G3
	Duluth, Minn.													
	Gary, Ind. Harbor Indiana			\$59.00 U1	\$70.50 U1	\$76.00 U1, Y1		4.675 J3	3.85 J3 U1, 6.30 Y1	5.80 J3, U1 6.30 Y1	3.725 J3, U1, Y1	5.35 J3	5.65 J3, U1 6.15 Y1	
	Granite City, Ill.													
	Kokomo, Ind.													
	Middletown, Ohio											5.10 A7		
	Niles, Ohio Sharon, Pa.										4.225 S1	5.70 T4 5.80 S1	5.65 S1	7.30 S1
WEST	Pittsburgh, Pa. Midland, Pa.	\$54.00 U1	\$57.00 U1, C11	\$59.00 U1, J3	\$70.50 U1, J3	\$76.00 U1, C11	3.55 U1 3.65 J3	4.675 U1	3.85 U1, J3	5.80 U1, J3	3.725 J3, A7 3.975 A3 4.225 S7, S9	5.10 J3, A7 5.45 A3 5.80 B4, S7		
	Portsmouth, Ohio													
	Weirton Wheeling, Follansbee, W. Va.								4.10 W3		3.825 W3	5.10 W3	6.10 W3	7.95 W3
	Youngstown, Ohio					\$76.00 Y1, C10	3.55 U1 R3			6.30 Y1	3.725 U1, Y1, R3	5.10 R3, Y1 5.70 C5 5.80 B4	5.65 R3, U1 6.15 Y1	7.30 R3 7.80 Y1
	Fontana, Cal.	\$81.00 K1	\$83.00 K1	\$78.00 K1	\$89.50 K1	\$95.00 K1			4.45 K1	6.40 K1	4.975 K1	6.75 K1	6.55 K1	
	Geneva, Utah				\$70.50 C7				3.85 C7	5.80 C7				
	Kansas City Mo.								4.45 S2		4.325 S2			
	Los Angeles Torrance, Cal.				\$89.50 B2	\$96.00 B2			4.45 C7, B2	6.35 B2	4.475 C7, B2	6.85 C1	6.40 B2	
	Minnequa, Colo.								4.30 C6		4.775 C6			
	San Francisco Niles, Pittsburg, Cal.				\$89.50 B2				4.40 B2 4.56 P9	6.30 B2	4.475 C7, B2		6.40 B2	
SOUTH	Seattle, Wash.				\$89.50 B2				4.50 B2	6.40 B2	4.725 B2		6.65 B2	
	Atlanta, Ga.										4.275 A8			
	Birmingham Ala. Alabama City, Ala.			\$59.00 T2					3.85 T2, R3	5.80 T2	3.725 T2, R3			
	Houston, Texas		\$65.00 S2		\$78.50 S2	\$84.00 S2			4.25 S2		4.125 S2			

Notations identify producers listed in key at end of table. Base prices, f.a.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE	STEEL PRICES
Hot-rolled 18 ga. & heavy.	Cold- rolled	Galvanized 19 ga.	Enameling 12 ga.	Long Tens 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot- rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.	
3.775 B3	4.575 B3				5.675 B3	6.925 B3							Bethlehem, Pa.
													Buffalo, N. Y.
													Claymont, Del.
													Coatesville, Pa.
4.175 A2					5.925 A2								Conschohegan, Pa.
													Harrisburg, Pa.
													Hartford, Conn.
													Johnstown, Pa.
									4.325 B3				Newark, N. J.
													New Haven, Conn.
													Phoenixville, Pa.
3.775 B3	4.575 B3	5.075 B3			5.675 B3	6.925 B3	7.775 B3		4.425 B3	\$8.80 B3	\$7.50 B3		Putnam, Conn.
									4.425 A5				Sparrows Pt., Md.
									4.425 R4				Worcester, Mass.
									4.70 L1				Trouton, N. J.
3.775 A7		5.075 A7	4.925 A7										Alton, Ill.
		5.075 R3											Ashland, Ky.
3.775 W8					5.675 U1				4.325 A3, N4, R3				Canton-Massillon Ohio
3.775 R3, J3	4.575 R3, J3		4.925 R3		5.675 R3, J3	6.925 R3, J3			4.325 A5				Chicago, Sterling, Ill.
3.975 G3	4.775 G3				6.225 G3	7.475 G3							Cleveland, Ohio
													Detroit, Mich.
													Duluth, Minn.
3.775 I3, U1, Y1	4.575 I3, U1, Y1	5.075 I3, U1	4.925 U1	5.475 U1	5.675 I3, U1 6.175 Y1	6.925 I3, U1 7.425 Y1			4.325 Y1	\$8.70 U1, I3, Y1	\$7.40 U1, I3	6.10 U1, Y1	Gary, Ind. Harbor, Indiana
4.30 G7	5.275 G7	5.50 G7	5.625 G2								\$7.60 G2	6.30 G7	Granite City, Ill.
		5.475 C9											Kokomo, Ind.
	4.575 A7		4.925 A7	5.475 A7									Middletown, Ohio
4.175 S1					5.675 S1						\$7.40 R3		Niles, Ohio Sharon, Pa.
3.775 U1, J3, A7 3.925 A3	4.575 U1, J3, A7	5.075 U1	4.925 U1		5.675 U1, J3	6.925 U1, J3	7.425 U1		4.325 A5 4.525 P6	\$8.70 U1, J3	\$7.40 U1, J3	6.10 U1	Pittsburgh, Pa. Midland, Pa.
									4.525 P7				Portsmouth, Ohio
3.775 W3, W5	4.575 W3, W5	5.075 W3, W5		5.475 W3, W5	6.025 W3	7.275 W3				\$8.70 W3, W5	\$7.40 W3, W5	6.35 W5	Weirton, Wheeling, Follansbee, W. Va.
3.775 U1, R3, Y1	4.575 R3, Y1	5.775 R1	4.925 Y1	6.05 E2	5.675 R3, U1 6.175 Y1	6.925 R3 7.425 Y1		5.65 E2 5.825 R1	4.325 Y1	\$8.70 R3			Youngstown, Ohio
4.725 K1	5.525 K1				6.625 K1	7.875 K1			5.125 K1				Fontana, Cal.
3.875 C7													Geneva, Utah
													Kansas City, Mo.
4.475 C7		5.825 C7						5.575 C7	5.125 C7, B2				Los Angeles, Torrance, Cal.
									4.575 C6				Minneapolis, Colo.
4.475 C7	5.525 C7	5.825 C7							4.975 C7	\$9.45 C7	\$8.15 C7		San Francisco, Niles, Pittsburg, Cal.
													Seattle, Wash.
													Atlanta, Ga.
3.575 T2, R3	4.575 T2	5.075 T2, R3			5.675 T2			4.925 R3	4.325 T2, R3	\$8.80 T2	\$7.50 T2		Birmingham, Ala. Alabama City Ala.
									4.725 S2				Houston, Tex.

† Special coated mfg
terne deduct 95¢ from
1.25-lb coke base box
price. Can-making quality
blackplate 55 to 128 lb
deduct \$2.20 from 1.25-lb
coke base box.
* COKE: 1.50-lb
add 25¢.
ELECTRO: 0.50-lb add
25¢; 0.75-lb add 65¢.

IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.										
STEEL PRICES		BARS					PLATES				WIRE	
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfg'r's. Bright
EAST	Bethlehem, Pa.				4.675 B3	6.00 B3	5.925 B3					
	Buffalo, N. Y.	3.95 B3, R3	3.95 B3, R3	4.975 B5	4.675 B3, R3	6.00 B3, B5	5.925 B3	3.90 B3			5.95 B3	
	Claymont, Del.							4.35 C4		5.35 C4		
	Coatesville, Pa.							4.35 L4		5.75 L4		
	Coshocken, Pa.							4.35 A2	4.95 A2		6.20 A2	
	Harrisburg, Pa.							6.50 C3	6.50 C3			
	Hartford, Conn.			5.475 R3		6.45 R3						
	Johnstown, Pa.	3.95 B3	3.95 B3		4.675 B3		5.925 B3	3.90 B3		5.25 B3	5.95 B3	5.225 B3
	Newark, N. J.			5.375 W10		6.35 W10						
	New Haven, Conn.											
	Phoenixville, Pa.											
	Putnam, Conn.			5.475 W10								
	Sparrows Pt. Md.		3.95 B3					3.90 B3		5.25 B3	5.95 B3	5.325 B3
	Worcester, Mass.					6.35 A5						5.525 A5
	Trenton, N. J.											
MIDDLE WEST	Alton, Ill.	4.50 L1										5.45 L1
	Ashland, Ky.							3.90 A7				
	Canton-Massillon	3.95 R3		4.925 R2, R3	4.675 R3 4.72 T5	5.99 T5 6.00 R2, R3						
	Chicago, Sterling, Ill.	3.95 U, W8, R3 4.55 N4	3.95 R3 4.70 N4	4.925 A5, B5, W8, W10	4.675 R3, U1, W8	6.00 B5, L2, R3, W8, W10 6.05 A5		3.90 U1, W8	4.95 U1	5.25 U1	5.95 U1	5.225 A3, N4, R3 5.325 K2 5.475 W7
	Cleveland, Ohio	3.95 R3	3.95 R3	4.925 A5, C13		6.00 C13 6.05 A5	5.925 R3	3.90 R3, J3	4.95 J3		5.95 R3, J3	5.225 A5, C13, R3
	Detroit, Mich.	4.10 R5 4.30 G3		5.075 R5, P8 5.175 P3	4.825 R5 5.025 G3	6.15 R5, P8 6.20 P3	6.675 G3	4.45 G3			6.90 G3	
	Duluth, Minn.											5.252 A5
	Gary, Ind. Harbor, Indiana	3.95 I3, U1, Y1	3.95 I3, U1, Y1	4.925 L2, M5, R3	4.675 I3, U1, Y1	6.90 L2, M5, R3, R5	5.925 I3, U1, 6.425 Y1	3.90 I3, U1, Y1	4.95 I3	5.25 U1	5.95 I3, U1 6.45 Y1	5.325 M4
	Granite City, Ill.							4.60 G2				
	Kokomo, Ind.											5.325 C9
	Middletown, Ohio											
	Niles, Ohio Sharon, Pa.							4.15 S1		5.70 S1	5.95 S1	
	Pittsburgh, Pa. Midland, Pa.	3.95 U1, J3	3.95 U1, J3	4.925 A5, J3, W10, R3, C8	4.675 U1, J3, C11	6.00 C8, C11, W10, 6.05 A5	5.925 U1, J3	3.90 U1, J3	4.95 U1, J3	5.25 U1, J3	5.95 U1, J3	5.225 A5, J3 5.475 P6
	Portsmouth, Ohio											5.625 P7
	Weirton, Wheeling, Follansbee, W. Va.	4.10 W3						3.90 W5 4.20 W3				
Youngstown, Ohio	3.95 U1, Y1, R3	3.95 U1, Y1, R3	4.925 Y1	4.675 U1, C10, Y1	6.00 C10, Y1	5.925 U1 6.425 Y1	3.90 U1, Y1, R3			5.95 R3 6.45 Y1	5.225 Y1	
WEST	Fontana, Cal.	4.65 K1	4.65 K1		5.725 K1		6.975 K1	4.50 K1		6.20 K1	6.55 K1	
	Geneva, Utah							3.90 C7			5.95 C7	
	Kansas City, Mo.	4.55 S2	4.55 S2		5.275 S2							5.825 S1
	Los Angeles, Torrance, Cal.	4.65 C7, B2	4.65 C7, B2	6.375 R3	5.725 B2		6.625 B2					6.175 C7, B1
	Minnequa, Colo.	4.40 C6	4.75 C6					4.70 C6				5.475 C6
	San Francisco, Niles, Pittsburg, Cal.	4.65 C7, P9 4.70 B2	4.65 C7, P9 4.70 B2				6.675 B2					6.175 C6, C7
	Seattle, Wash.	4.70 B2	4.70 B2				6.675 B2	4.80 B2			6.85 B2	
SOUTH	Atlanta, Ga.	4.50 A8	4.50 A8									5.475 A8
	Birmingham, Ala. Alabama City, Ala.	3.95 T2, R3	3.95 T2, R3				5.925 T2	3.90 T2, R3			5.95 T2	5.225 T2, R3
	Houston, Texas	4.35 S2	4.35 S2		5.075 S2			4.30 S2				5.625 S2

Key to Steel Producers

With Principal Offices

- 41 Acme Steel Co., Chicago
42 Alan Wood Steel Co., Conshohocken, Pa.
43 Allegheny Ludlum Steel Corp., Pittsburgh
44 American Cladmetals Co., Carnegie, Pa.
45 American Steel & Wire Div., Cleveland
46 Angell Nail & Chaplet Co., Cleveland
47 Armco Steel Corp., Middletown, O.
48 Atlantic Steel Co., Atlanta, Ga.

- 81 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
82 Bethlehem Pacific Coast Steel Corp., San Francisco
83 Bethlehem Steel Co., Bethlehem, Pa.
84 Blair Strip Steel Co., New Castle, Pa.
85 Blas & Laughlin Inc., Harvey, Ill.

- C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia-Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Glassport, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland

- D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

- F1 Firth Sterling Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

- G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit

- H1 Hanna Furnace Corp., Detroit

- I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

- J Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago

- K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

- L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

- M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercor Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Myatic Iron Works, Everett, Mass.

- N1 National Supply Co., Pittsburgh
N2 National Tube Co., Pittsburgh
N3 Niles Rolling Mills Co., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.

- O1 Oliver Iron & Steel Co., Pittsburgh

- P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh

- P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.

- R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co. (John A.), Trenton, N.
R5 Rotary Electric Steel Co., Detroit

- S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sloss Sheffield Steel & Iron Co., Birmingham
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Sweet's Steel Co., Williamsport, Pa.
S11 Seidelhuber Steel Rolling Mills, Seattle

- T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Birmingham
T3 Tennessee Products & Chem. Co., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.

- U1 United States Steel Co., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.

- W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh

- Y1 Youngstown Sheet & Tube Co., Youngstown

MERCHANT WIRE PRODUCTS

	Standard & Coated Nails	Woven Wire Fence 9-15 1/2 ga.	Fence Posts	Single Loop Bale Ties	Twisted Barbed Wire	Gal. Barbed Wire	Merch. Wire Ann'd	Merch. Wire Gal
F.o.b. Mill	Gal	Col	Col	Col	Col	Col	#/lb.	#/lb.
Alabama City R3*	118	135		132			144 6.075	6.325
Aliquippa, Pa. J3	127	141					145 6.075	6.525
Atlanta A8	130	140		135			149 6.325	6.675
Bartonville K2	127	139	140	132	148		148 6.075	6.50
Buffalo W6								
Chicago N4	127	137		132	146		146 6.075	6.40
Cleveland A6								
Cleveland A5							6.075	6.225
Crawfordsville M4	130	140		134			149 6.175	6.55
Donora, Pa. A5*	118	133		132			142 6.075	6.225
Duluth A5	118	133		132			142 6.075	6.225
Fairfield, Ala. T2*	118	133		132			142 6.075	6.225
Houston S2	135	147					156 6.475	6.925
Johnston, Pa. B3	127		148		149			6.575
Joliet, Ill. A5*	118	133		132			142 6.075	6.225
Kokomo, Ind. C9			142				6.175	6.425
Los Angeles B2								
Kansas City S2	139			144			160 6.475	7.125
Minneapolis C6*	123	146	138	137			153 6.325	6.70
Monessen P6								
Moline, Ill. R3				136				
Pittsburg, Cal. C7*	137	156		156	162	162	7.025	7.125
Portsmouth P7	127	138		147			147 6.075	6.45
Monessen P6							6.47	
Rankin, Pa. A5*	118	133					142 6.075	6.225
Sa. Chicago R3*	118	135	140	132			144 6.075	6.325
S. San Fran. C6							167 7.025	7.40
Sparrows Pt. B3	129			134	151			6.675
Struthers, O. Y1							6.075	6.475
Terrance, Cal. C7*	138						7.025	
Worcester A5*	124						6.375	6.525
Williamsport, Pa. S10								

Cut Nails, carloads base \$7.80 per 100 lb. (less 20¢ to jobbers) at Conshohocken, Pa. (A7) Wheeling, W. Va. (W5) \$7.80.

* Add 45¢ per 100 lb. on Std. 3 Coated Nails.

† Zinc extra if not included on Galv. Merch. Wire.

‡ Galv. Merch. Wire based on 15¢ Zinc.

STAINLESS STEELS

Base price, cents per lb., f.o.b. mill. Add 4.7 pct to base and extras.

Product	301	302	303	304	316	321	347	410	416	430
Ingot, rerolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs, billets, rerolling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs, die blocks, rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets, forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars, wires, structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip, hot-rolled	26.50	28.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip, cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2; (type 316 add 4.5¢) J3; Baltimore, E1; Middletown, O., A7; Massillon, O., R3; Gary, Ind., U2; Bridgeville, Pa., U2; New Castle, Ind., J2; Ft. Wayne, Ind., J4; Lockport, N. Y., R4.

Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; (type 316 add 4.5¢) W. Lechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C5; Lockport, N. Y., S4; Sharon, Pa., S1 (type 301 add 1/4¢); Butler, Pa., A7; Wallingford, Conn., W1.

Bars: Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, Ind., J4; Lockport, N. Y., S4; Canton, O., T3; Ft. Wayne, Ind., J4.

Wires: Waukegan, Ind., A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, Ind., J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, N. Y., A3; Monessen, Pa., F1; Syracuse, Ind., U2; Bridgeville, Pa., U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, Ind., C11.

Plates: Brackenridge, Pa., A3 (type 416 add 1/4¢); Butler, Pa., A7; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., J2; Lockport, N. Y., S4; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3.

Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, Ind., C11; Ferndale, Mich., A3; Washington, Pa., J2.

Forging billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, Ind., C11.

ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 series.

WASHINGTON STEEL—Slightly lower on 300 series except where noted.

Miscellaneous Prices

PIPE AND TUBING

Base discounts f.o.b. mills. Base price about \$200 per net ton.

	BUTTWELD												SEAMLESS							
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2-3 In.		3 1/2-4 In.	
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.
STANDARD T. & C.																				
Sparrows Pt. B3	30.5	8.25	33.5	12.25	35.5	15.75	36.5	16.25	37.0	17.25	37.5	17.75	38.0	18.25						
Youngtown R3	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25						
Fentona K1	21.0	+1.25	24.0	2.75	26.5	6.25	27.0	6.75	27.5	7.75	28.0	8.25	28.5	8.75						
Pittsburgh J3	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75	24.0	2.25	27.0	5.75	29.0	7.75
Alton, Ill. L1	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25						
Sharon M3	32.5	9.25	35.5	13.25	38.0	16.25	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.25						
Pittsburgh N1	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0		27.0		29.0	
Wheeling W5	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25						
Wheeling W4	32.5	10.25	35.5	13.25	38.0	15.75	38.5	16.75	39.0	17.25	39.5	17.75	40.0	18.75						
Youngtown Y1	32.5	10.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	8.75
Indiana Harbor Y1	31.5	9.25	34.5	13.25	37.0	16.75	37.5	17.25	38.0	18.25	38.5	18.75	39.0	19.25						
Lorain N2	32.5	15.25	35.5	14.25	38.0	17.75	38.5	18.25	39.0	19.25	39.5	19.75	40.0	20.25	24.0	3.75	27.0	6.75	29.0	8.75
EXTRA STRONG PLAIN ENDS																				
Sparrows Pt. B3	30.25	9.5	34.25	13.5	36.25	17.0	36.75	17.5	37.25	18.5	37.75	19.0	38.25	19.5						
Youngtown R3	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5						
Fentona K1	20.75		24.75		26.75		27.25		27.75		28.25		28.75							
Pittsburgh J3	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0	23.75	2.0	27.75	6.5	31.25	10.0
Alton, Ill. L1	29.25	8.5	33.25	12.5	35.25	16.0	35.75	16.5	36.25	17.5	36.75	18.0	37.25	18.5						
Sharon M3	32.25	10.5	36.25	14.5	38.25	17.5	38.75	18.0	39.25	18.5	39.75	19.0	40.25	19.5						
Pittsburgh N1	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75		27.75		31.25	
Wheeling W5	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5						
Wheeling W4	32.25	10.0	36.25	14.0	38.25	16.0	38.75	17.0	39.25	17.5	39.75	18.0	40.25	19.0						
Youngtown Y1	32.25	11.5	36.25	15.5	37.75	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	22.5	23.75	4.5	27.75	8.5	31.25	12.0
Indiana Harbor Y1	31.25	10.5	35.25	14.5	37.25	17.5	37.75	18.5	38.25	19.5	38.75	20.0	39.25	20.5						
Lorain N2	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75	4.5	27.75	8.5	31.25	12.0

Galvanized discounts based on zinc, at 17¢ per lb. East St. Louis. For each 1¢ change in zinc, discounts vary as follows: 1/2 in., 3/4 in., and 1 in., 1 pt.; 1 1/4 in., 1 1/2 in., 2 in., 3/4 pt.; 2 1/2 in., 3 in., 1/2 pt. Calculate discounts on even cents per lb. of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb., use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢. Threads only butt-weld and seamless, 1 pt. higher discount. Plain ends, butt-weld and seamless, 3 in. and under, 3/4 pts. higher discount. Butt-weld jobbers' discount, 5 pct. St. Louis zinc price now 12.5¢.

COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	\$14.50 to \$15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$17.50 to \$18.00
Foundry, oven coke	
Buffalo, del'd	\$28.08
Chicago, f.o.b.	23.00
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	22.75
Philadelphia, f.o.b.	23.95
Swedeland, Pa., f.o.b.	23.85
Palmsville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	22.50
St. Louis	25.40
Birmingham, del'd	23.21
Neville Island	23.00
Lone Star, Tex., f.o.b.	18.50

ELECTRICAL SHEETS

22 Ga. H-R cut length	Armature	Elec.	Meter	Dynamo	Transf. 72	Transf. 65	Transf. 58
F.o.b. Mill Cents Per Lb.							
Beech Bottom W5	7.85	9.10	9.90	10.45	11.00	11.70	
Brackenridge A3	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Granite City G2	7.35	7.85	9.10				
Ind. Harbor J3	7.35	7.85	9.10				
Mansfield E2	7.35	7.85	9.10				
Niles, O. N3	7.35	7.85					
Vandergriff U1	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Warren, O. R3	7.35	7.85	9.10				
Zanesville A7	7.35	7.85	9.10	9.90	10.45	11.00	11.70

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	\$105.30 to \$108.80
6 to 24-in., del'd N.Y.	108.50 to 109.50
6 to 24-in., Birmingham	91.50 to 96.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	\$123.00 to \$130.00
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

BOILER TUBES

\$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size	Seamless	Elec. Weld
	OD- In.	B.W. Ga.	H.R. C.D. H.R. C.D.
Babcock & Wilcox	2	13	23.93 28.14 23.19 27.29
	2 1/2	12	32.17 37.83 31.19 36.67
	3	12	35.78 42.11 34.69 40.82
	3 1/2	11	44.72 52.65 43.36 51.05
	4	10	55.52 65.31 53.83 63.32
National Tube	2	13	22.81 27.94 22.23
	2 1/2	12	31.28 38.31 30.51
	3	12	35.87 43.93 34.98
	3 1/2	11	42.56 52.12
	4	10	54.02 66.16
Pittsburgh Steel	2	13	28.58
	2 1/2	12	32.16 39.19
	3	12	36.87 44.93
	3 1/2	11	43.76 53.32
	4	10	67.68

C-R SPRING STEEL

Cents Per Lb. F.o.b. Mill	CARBON CONTENT				
	0.26- 0.40	0.41- 0.60	0.61- 0.80	0.81- 1.05	1.06- 1.35
Bridgeport, Conn. S7	5.80	7.65	8.25	10.20	12.50
Carnegie, Pa. S9	7.65	8.25	10.20	12.50	
Cleveland A5	5.10	7.30	8.25	10.20	12.50
Detroit D1	6.45	7.50	8.10		
New Castle, Pa. B4	6.80	7.65	8.25	10.20	
New Haven, Conn. D1	6.70	7.60	8.20		
Sharon, Pa. S1	5.80	7.65	8.25	10.20	12.50
Trenton, N. J. R4	7.95	8.55	10.50	12.80	
Warren, Ohio T4	6.20	7.65	8.25	10.20	12.50
Weirton, W. Va. W3	5.80	7.65	8.25	10.20	12.50
Worcester, Mass. A3	5.40	7.60	8.55	10.50	12.80
Youngstown C5		7.65	8.25	10.20	12.50

*Sold on Pittsburgh base.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Bl. Furnace Silvery
Bethlehem B3	56.50	57.00	57.50	58.00		
Birmingham R3	50.88	51.38				
Birmingham W9	50.88	51.38				
Birmingham S5	50.88	51.38				
Buffalo R3	54.50	55.00	55.50			
Buffalo H1	54.50	55.00	55.50			66.75
Buffalo H6	54.50	55.00	55.50			
Chicago I4	54.50	55.00	55.00	55.50		
Cleveland A5	54.50	55.00	55.00	55.50	59.50	
Cleveland R3	54.50	55.00	55.00			
Duingerfield, Tex. L3	50.50	51.00	51.00			
Duluth I4	54.50	55.00	55.00	55.50		
Erie I4	54.50	55.00	55.00	55.50		
Everett, Mass. M6		59.25	59.75			
Fentona K1	60.50	61.00				
Geneva, Utah C7	54.50	55.00				
Granite City, Ill. K3	56.40	56.90	57.40			
Hubbard, Ohio Y1	54.50	55.00	55.00			
Jackson, Ohio J1G1						65.50
Minnequa C6	56.50	57.50	57.50			
Monessen P6	56.50					
Neville Island P4	54.50	55.00	55.00	55.50		
Pittsburgh U1	54.50			55.50		
Sharpsville S3	54.50	55.00	55.00	55.50		
Steeltown B3	56.50	57.00	57.50	58.00	62.50	
Swedeland A2	58.50	59.00	59.50	60.00		
Toledo I4	54.50	55.00	55.00	55.50		
Troy, N. Y. R3	56.50	57.00	57.50		62.50	
Youngtown Y1	54.50	55.00	55.00	55.50		
N. Tonawanda, N. Y. T1		55.00	55.50			

DIFFERENTIALS: Add \$0.50 per ton for each 0.25 pct silicon over base, (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), \$0.60 per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. S. attract 3¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add \$1.50 per ton net for each 0.50 pct silicon or base (6.01 to 6.50 pct) up to 17 pct. \$1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrous silicon prices are \$1 over comparable silvery iron.

"Joe, how can we
save money
on these
small parts?"

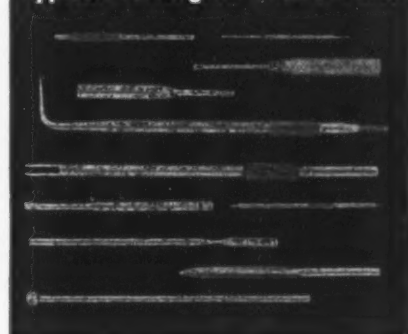


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They have the
know-how and the
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Specialty Department
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Miscellaneous Prices

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer U1	3.775	4.25	4.925				
Chicago R3				6.65			
Cleveland R1							
Ensley T2	3.775	4.25					
Fairfield T2		4.25		6.65		4.775	
Gary U1	3.775	4.25				4.775	
Ind. Harbor I3	3.775		4.925	6.65		4.775	
Johnstown B3		4.25					
Joliet U1		4.25	4.925				
Kansas City S2							
Lackawanna B3	3.775	4.25	4.925			4.775	
Lebanon B3				6.65			
Minnequa C6	3.775	4.75	4.925	6.65		4.775	9.85
Pittsburgh R3							
Pittsburgh O1							
Pittsburgh P5							
Pittsburgh J3				6.65			
Pittg., Cal. C7						4.925	
Seattle B2				7.15		4.925	
Steelton B3	3.775		4.925			4.775	
Struthers Y1				6.65			
Torrance C7						4.925	
Youngstown R3				6.65			

TOOL STEEL

F.o.b. mill

Add 4.7 pct to base and extras.

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	\$1.505
18	4	1	—	5	\$2.13
18	4	2	—	—	\$1.65
1.5	4	1.5	8	—	\$1.06
6	4	2	6	—	\$6.56
High-carbon chromium					63.5¢
Oil hardened manganese					35¢
Special carbon					32.5¢
Extra carbon					27¢
Regular carbon					23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb. higher. West of Mississippi, 5.5¢ higher.

CLAD STEEL

Add 4.7 pct to base and extras.

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. L4	\$29.5	
Washington, Pa. J2	\$29.5	
Claymont, Del. C4	\$28.00	
Conshohocken, Pa. A2		\$27.50
New Castle, Ind. I2	\$29.77	\$26.24
Nickel-carbon		
10 pct Coatesville, Pa. L4	32.5	
Inconel-carbon		
10 pct Coatesville, Pa. L4	40.5	
Monel-carbon		
10 pct Coatesville, Pa. L4	33.5	
No. 302 Stainless-copper stainless, Carnegie, Pa. A4		77.00
Aluminized steel sheets, hot dip, Butler, Pa. A7		7.75

* Includes annealing and pickling, or sandblasting.

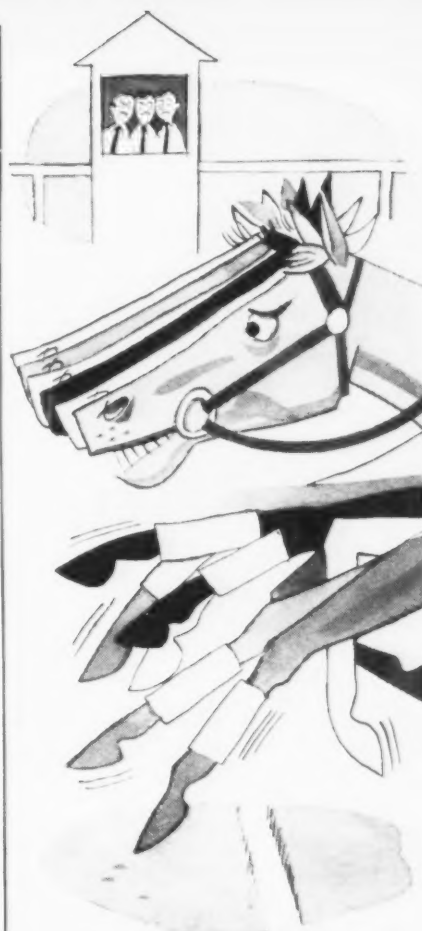
ELECTRODES

Cents per lb. f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
GRAPHITE		
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2 1/2	24, 30	23.15
2	24, 30	25.36
CARBON		
10	100, 110	8.45
35	65, 110	8.45
30	65, 84, 110	8.45
24	72 to 104	8.45
20	84, 90	8.45
17	60, 72	8.45
14	60, 72	9.02
10, 12	60	9.30
8	60	9.58

FLUORSPAR

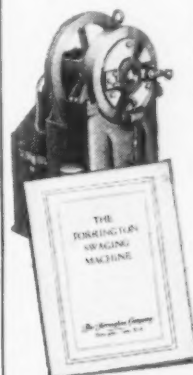
Washed gravel, f.o.b. Rosiclare, Ill.
Price, net ton; Effective CaF₂ content:
70% or more \$43.00
60% or less 40.00



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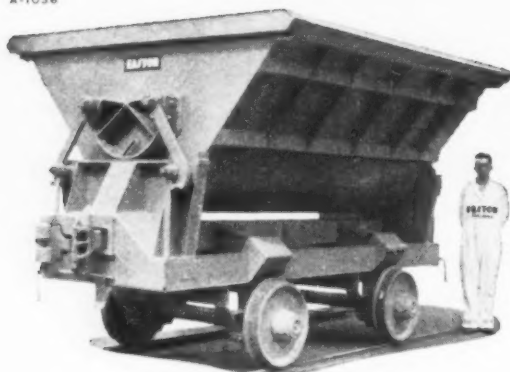
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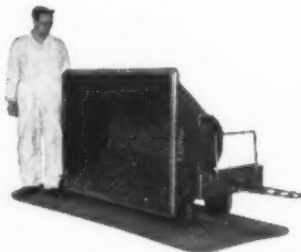
A-1036



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Rocker Dump Trailers for all purposes on steel, solid rubber or pneumatic tires.



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Miscellaneous Prices

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base, discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched—Sq.

	Pct Off List			Pct Off List	
	Less Keg.	Reg.		Less Keg.	K. Hvy.
1/2 in. & smaller.	15	28 1/2	15	28 1/2	
9/16 in. & 5/8 in.	12	25	6 1/2	21	
3/4 in. to 1 1/2 in.					
inclusive	9	23	1	16 1/2	
1 5/8 in. & larger.	7 1/2	22	1	16 1/2	

Nuts, Hot Pressed—Hexagon

1/2 in. & smaller.	26	37	22	34
9/16 in. & 5/8 in.	16 1/2	29 1/2	6 1/2	21
3/4 in. to 1 1/2 in.				
inclusive	12	25	2	17 1/2
1 5/8 in. & larger.	8 1/2	23	2	17 1/2

Nuts, Cold Punched—Hexagon

1/2 in. & smaller.	26	37	22	34
9/16 in. & 5/8 in.	23	35	17 1/2	30 1/2
3/4 in. to 1 1/2 in.				
inclusive	19 1/2	31 1/2	12	25
1 5/8 in. & larger.	8 1/2	23	2	17 1/2

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
1/2 in. & smaller.	35	45	28 1/2	29 1/2
9/16 in. & 5/8 in.	23	35	17 1/2	30 1/2
3/4 in. to 1 1/2 in.				
inclusive	24	36	15	28 1/2
1 5/8 in. & larger.	13	26	8 1/2	23
			Light	
7/16 in. & smaller.	35	45		
1/2 in. thru 5/8 in.	28 1/2	39 1/2		
3/4 in. to 1 1/2 in.				
inclusive	26	37		

Stove Bolts

Pct Off List

Packaged, steel, plain finished 48—10
Packaged, plain finish 31—10
Bulk, plain finish 62*
*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.
**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets

Base per 100 lb

1/2 in. & larger \$7.85

Cap and Set Screws

(In bulk)

Pct Off List

Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 5/8 in. x 6 in., SAE 1020, bright 54
3/4 in. thru 1 in. up to & including 6 in. x 6 in. & shorter 48
high C double heat treat 46
3/4 in. thru 1 in. up to & including 6 in. x 6 in. & shorter 41
Milled studs 38
Flat head cap screws, listed sizes 16
Fillister head cap, listed sizes 34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter 53

Machine and Carriage Bolts

Pct Off List

	Less Case	C.
1/2 in. & smaller x 6 in. & shorter	15	28 1/2
9/16 in. & 5/8 in. x 6 in. & shorter	18 1/2	30 1/2
3/4 in. & larger x 6 in. & shorter	17 1/2	29 1/2
All diam. longer than 6 in.	14	27 1/2
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	24	

How to find Fast Answers to metal finishing problems

*Consult the Company that helps with all these finishes:
... plated ... organic ... conversion coatings*

UNITED CHROMIUM offers you unusual cooperation on surface finishing problems. Unusual, because this aid is not limited to one type of finish. It covers metallic and organic coating systems, both decorative and functional. The service rendered in the application of Unichrome products for ordnance and civilian goods finishing is based on 25 years' experience in the field.

Such specialized yet extensive knowledge of coating systems and how to apply them can help you speed up selection of the right finish on your product, improve results or reduce costs. To illustrate:



LONGER LASTING CLEAR ENAMEL FOR BRIGHT FINISHES

Over 70 clear coatings were given year-long Florida exposure tests by a well known company. Most were baking types. Unichrome Coating A-140 was one of the few air-dry types. It was applied to a thickness of 0.4 mil, as against 0.8 for the others. Despite this, it was the coating that stood up best by far in the entire test group, being good as new at the end of the test. When applied to today's chromium or bright zinc finishes, such Unichrome Enamels assure extra durability and resistance to corrosion, and a higher quality product.

BRILLIANT, DURABLE FINISHES WITH ZINC PLATING

No question about the sales winning eye appeal of zinc plated products which have been chemically treated in Unichrome Clear Dip Solution. As little as .0002" to .0005" of zinc plate can be made bright as chromium by this treatment. The Unichrome Dip Finish is integral with the zinc and *stays* bright — resisting exposure, dulling and finger-marking. When handling is a factor, a Unichrome Clear Enamel can provide extra wear and corrosion resistance for the finish.

IMPROVED PROCESS MINIMIZES TODAY'S COPPER PLATING PROBLEMS

Unichrome Pyrophosphate Copper Process deposits smooth copper which needs little buffing, if at all — making it excellent for plating directly with chromium. Its moderate temperature permits use of plastic or rubber lined tanks formerly used for nickel plating. Containing no cyanide, the Unichrome Copper Bath minimizes the waste disposal problem.

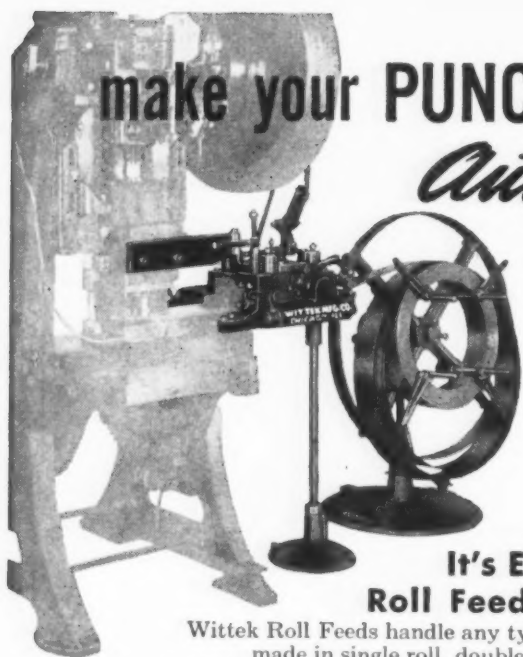


COATINGS for METALS

UNITED CHROMIUM, INCORPORATED 100 East 42nd St., New York 17, N. Y.

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In Canada: United Chromium Limited, Toronto, Ont.



make your PUNCH PRESSES *Automatic*

It's Easy...with WITTEK Roll Feeds and Reel Stands

Wittek Roll Feeds handle any type of coiled strip stock and are made in single roll, double roll, and compound types with straighteners, in models to feed in any of four directions. They are reliable and accurate with simple, quick adjustment of feed length. Standard sizes and models meet a wide variety of press size and capacity conditions.

Wittek Reel Stands facilitate handling coiled stock.

*Write for
full particulars

WITTEK Manufacturing Co.

4329 W. 24th Place, Chicago 23, Illinois



MORE FLEXIBILITY IN YOUR SHOP

**Harden, heat treat, temper and anneal
with one furnace . . the Johnson No. 706.**

Another in the Johnson line of dependable gas equipment has won its place in both large and small shops and plants. Operators like its easy adaptability. Six Johnson Direct Jet Bunsen Burners with individual shut off valves and pilot lights provide steady, easily controlled heat from 300 to 1850° F. Semi-muffled type with burners operating below Carbofrax hearth. Firebox: 7"x 13"x 16½". Also available bench style. Write for complete and factual information.

A smaller version of this highly flexible furnace is the No. 654. Four burners deliver 300 to 1800° F. Firebox: 5" x 7¾" x 13½". Available as pedestal or bench style.

JOHNSON GAS APPLIANCE CO.

598 E Avenue, N. W., • Cedar Rapids, Iowa

Johnson No. 706 Pedestal Style \$278.00

Bench Style \$250.00

Johnson No. 654 Pedestal Style \$150.00

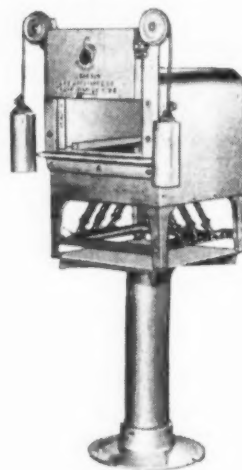
Bench Style \$124.00

F.O.B. Factory

JOHNSON

INDUSTRIAL GAS EQUIPMENT

Furnaces • Burners • Torches • Valves • Mixers • Blowers



Model No.
706

Miscellaneous Prices

REFRACTORIES

Fire Clay Brick	Carloads, per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5) . . .	\$94.60
No. 1 Ohio	88.00
Sec. quality, Pa., Md., Ky., Mo., Ill. . .	88.00
No. 2 Ohio	79.20
Ground fire clay, net ton, bulk (ex- cept Salina, Pa., add \$1.50)	13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$94.60
Childs, Pa.	99.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, East- ern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chi- cago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.70

Chrome Brick

Standard chemically bonded Balt. Chester	Per Net Ton
	\$82.00

Magnesite Brick

Standard, Baltimore	\$104.00
Chemically bonded, Baltimore	93.00

Grain Magnesite

St. ¾-in. grains	
Domestic, f.o.b. Baltimore in bulk fines removed	\$62.70
Domestic, f.o.b. Chewalah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsyl-
vania, West Virginia and Ohio
per net ton, bulk Midwest, add
10¢; Missouri Valley, add 20¢. \$13.75

LAKE SUPERIOR ORES

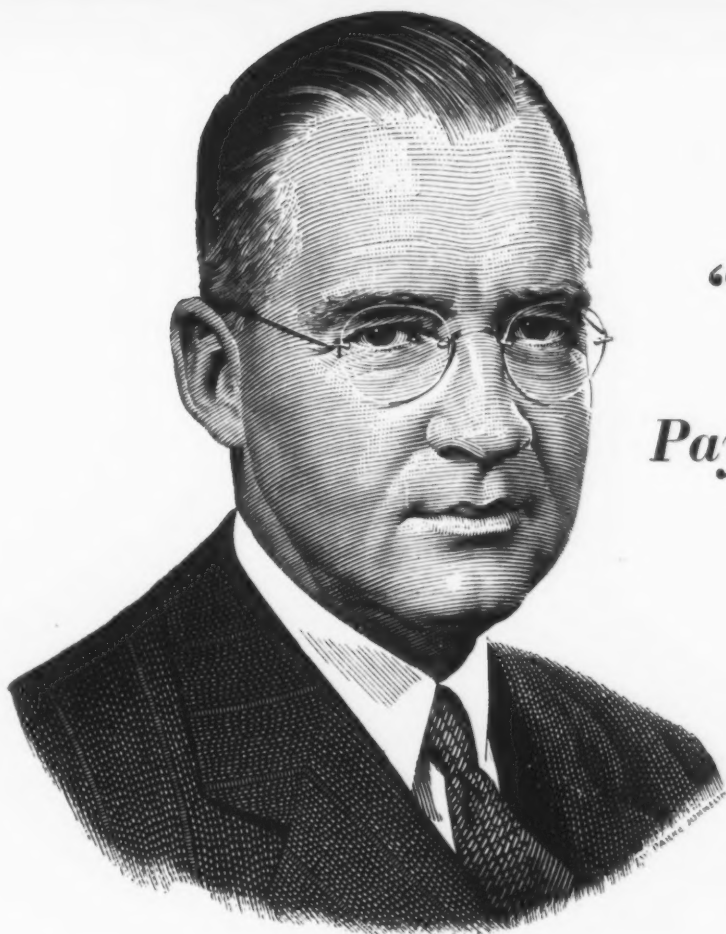
51.50% Fe; natural content, delivered
lower Lake ports. Prices effective July
26, 1952

	Gross Ton
Old range, bessemer	9.45
Old range, nonbessemer	9.30
Mesabi, bessemer	9.20
Mesabi, nonbessemer	9.05
High phosphorus	9.05

After adjustments for analysis, prices
will be increased or decreased as the case
may be for increases or decreases after
Dec. 1, 1950, in Lake vessel rates, upper
Lake rail freights, dock handling charges
and taxes thereon.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.	
Swedish sponge iron c.i.f. New York, ocean bags	10.9¢
Canadian sponge iron, del'd. in East	12.0¢
Domestic sponge iron, 98+% Fe, carload lots	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe	44.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	60.0¢
Hydrogen reduced iron, mi- nus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe. 83.0¢ to \$1.48	
Aluminum	31.5¢
Brass, 10 ton lots	20.00¢ to 33.25¢
Copper, electrolytic, 10.75¢ plus metal value	
Copper reduced	10.00¢ plus metal value
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quantity, del'd	\$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	22.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	38.5¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	83.0¢
Stainless steel, 316	\$1.10
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	\$6.00
Zinc, 10 ton lots	23.0¢ to 30.5¢



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to install the
Payroll Savings Plan..."***

M. B. FOLSOM

Treasurer, Eastman Kodak Company

"Continued saving will play an important part in protecting us against a renewal of inflation. The person who saves contributes to the nation's stability and to his family's security. He can now also obtain a higher return on his investment than he could in the past, because of the improvements in Defense Bonds now offered by the U. S. Treasury. I urge employers to install the Payroll Savings Plan wherever practicable, and employees to take advantage of such plan. By investing regularly in improved Defense Bonds, Americans serve their nation's interests as well as their own."

If your company does not have the Payroll Savings Plan—

Please tear out this page and send it to the "Big Boss." Urge that he read, carefully, Mr. Folsom's superb summary of the Payroll Savings Plan and its benefits for employers, employees and our country.

The following figures should be particularly interesting to anyone not familiar with the wide adoption and the steady growth of the Payroll Savings Plan:

- 45,000 companies offer their employees the Payroll Savings Plan.
- since January 1, 1951, enrollment in The Plan has increased from 5,000,000 to 7,500,000.
- in some companies, more than 90% of the employees are systematic bond buyers—in literally thousands of other companies, employee participation runs 60%, 70%, 80%.

- payroll savers are putting aside \$150,000,000 per month in U.S. Defense Bonds.
- the cash value of Series E Bonds held by individuals on December 31, 1951, amounted to \$34.8 billion—\$4.8 billion more than the cash value of Series E Bonds outstanding in August, 1945.

Phone, wire or write to Savings Bond Division, U.S. Treasury Department, Washington Building, Washington, D.C. Your State Director will show you how easy it is to install and maintain the Payroll Savings Plan.

If you have a Payroll Savings Plan, your State Director will show you how to build employee participation through a person-to-person canvass that puts an Application Blank in the hands of every employee. That's all you have to do—your employees will do the rest.

The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

The Iron Age



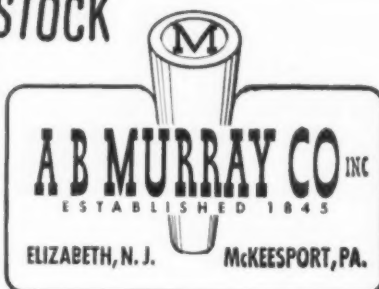
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Call Murray's nearest warehouse for seamless cold-drawn mechanical tubing in carbon steel; also for seamless or welded stainless tubing in many analyses; size range . . . 1/8- to 14- inch O. D.

For aid in finding the tubing best suited to your particular need, consult a Murray representative. He may help you uncover new economies in the purchase of mechanical tubing.

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Other Murray products include carbon steel tubing and pipe for mechanical and pressure purposes: Welding and screw type pipe and tube fittings. Tube bending, up-setting, swaging.



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Producers of fine tool steels—High Speed Steels
Die Steels—Hot Work and Shock Resisting Steels
Carbon Tool Steels.



Ferroalloy Prices

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk in carload delivered. (65-72% Cr, 2% max. Si.)
0.06% C . . . 34.50 0.20% C . . . 33.50
0.10% C . . . 34.00 0.50% C . . . 33.25
0.15% C . . . 33.75 1.00% C . . . 33.00
2.00% C . . . 32.75
65-69% Cr, 4-9% C . . . 24.75
62-66% Cr, 4-6% C, 6-9% Si . . . 25.60

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.
Carloads . . . 25.85
Ton lots . . . 28.00
Less ton lots . . . 29.50

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.
0.10% max. C. \$1.18
0.50% max. C. 1.14
9 to 11% C. 1.11

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.)
Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 25.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.
Bulk 1-in. x down, 25.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump delivered.
30-33% Ca, 60-65% Si, 3.00% max. Fe.
Carloads 19.00
Ton lots 22.10
Less ton lots 23.60

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy lump, delivered.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads 20.00
Ton lots 22.30
Less ton lots 23.30

CMSZ

Contract price, cents per lb of alloy, delivered.
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.
Alloy 5: 50.56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.
Ton lots 20.76
Less ton lots 22.00

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, 1/2 in. x 12 mesh.
Ton lots 17.50
Less ton lots 19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.
Ton lots 16.50
Less ton lots 17.75

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
Carload packed 18.00
Ton lots to carload packed 19.00
Less ton lots 20.50

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.
F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O. \$225
F.o.b. Johnstown, Pa. \$227
F.o.b. Sheridan, Pa. \$225
F.o.b. Etna, Clairton, Pa. \$228
Add \$2.80 for each 1% above 82% Mn, subtract \$2.80 for each 1% below 78% Mn.
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.
Carload, bulk 12.45
Ton lots, packed 14.95

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- TEMPERING
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- CASTING
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- HEAT-TREATING
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your workpiece with it. When
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the specified temperature has
been reached.

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Available in these temperatures (°F)

113	263	400	950	1500
125	275	450	1000	1550
138	288	500	1050	1600
150	300	550	1100	1650
163	313	600	1150	1700
175	325	650	1200	1750
188	338	700	1250	1800
200	350	750	1300	1850
213	363	800	1350	1900
225	375	850	1400	1950
238	388	900	1450	2000

FREE —Tempil® "Basic Guide
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— 16 1/4" by 21" plastic-laminated wall
chart in color. Send for sample pellets,
stating temperature of interest to you.

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Ferroalloy Prices

Spiegeleisen

Contract prices gross ton: lump, f.o.b.
16-19% Mn 19-21% Mn
3% max. Si 3% max. Si
Palmerton, Pa. \$84.00 \$85.00
Pgh. or Chicago 84.00 85.00

Manganese Metal

Contract basis, 2 in. x down, cents per
pound of metal, delivered.
96% min. Mn, 0.2% max. C, 1% max.
Si, 2.5% max. Fe.
Carload, packed 36.95
Ton lots 38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed
east of Mississippi, cents per pound.
Carloads 30.00
Ton lots 32.00
Less ton lots 34.00 to 37.00

Low-Carbon Ferromanganese

Contract price, cents per pound Mn con-
tained, lump size, del'd Mn 85-90%.

Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	28.45	30.30 31.50
0.07% max. C	27.95	29.80 31.00
0.16% max. C	27.45	29.30 30.50
0.30% max. C	26.95	28.80 30.00
0.50% max. C	26.45	28.30 29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30 26.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract
price, carloads, lump, bulk, delivered, per
lb of contained Mn 21.35¢

Silicomanganese

Contract basis, lump size, cents per
pound of metal, delivered, 65-68% Mn,
18-20% Si, 1.5% max. C. For 2% max. C,
deduct 0.2¢.
Carload bulk 11.40
Ton lots 13.05
Briquet, contract basis carlots, bulk
delivered, per lb of briquet 12.65
Ton lots, packed 14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk,
Iowa, or Wenatchee, Wash., \$95.50 gross
ton, freight allowed to normal trade area.
Si 15.01 to 15.50 pct, f.o.b. Niagara Falls,
N. Y., \$93.00. Add \$1.055 per ton for each
additional 0.50% Si up to and including
17%. Add \$1.00 for each 0.50% Mn over
1%.

Silicon Metal

Contract price, cents per pound con-
tained Si, lump size, delivered, for ton lots
packed.
96% Si, 2% Fe 18.00
97% Si, 1% Fe 18.50

Silicon Briquets

Contract price, cents per pound of
briquet bulk, delivered, 40% Si, 2 lb Si
briquets.
Carloads, bulk 6.95
Ton lots 8.55

Electric Ferrosilicon

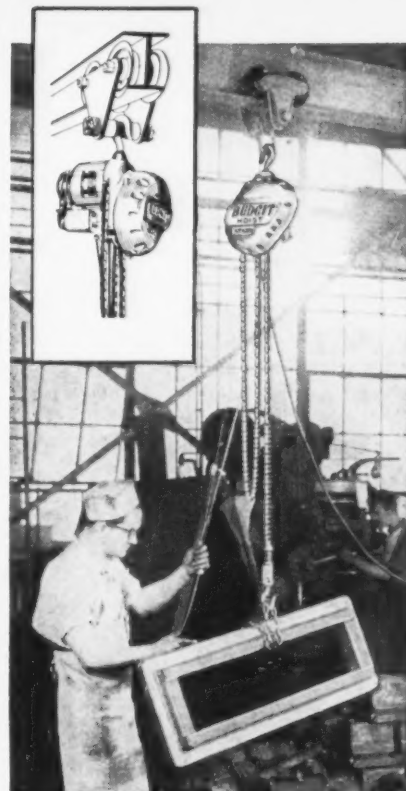
Contract price, cents per pound con-
tained Si, lump, bulk, carloads, delivered.
25% Si 20.00 75% Si 14.30
50% Si 12.40 85% Si 15.55
90-95% Si 17.00

Calcium Metal

Eastern zone contract prices, cents per
pound of metal, delivered.
Cast Turnings Distilled
Ton lots 32.05 32.95 33.75
Less ton lots 2.40 3.30 4.55

Ferrovanadium

35-55% contract basis, delivered,
per pound, contained V
Openhearth 33.00-33.10
Crucible 3.10-3.20
High speed steel (Primor) 3.20-3.25



LIFTS FAST... SAVES FAST

Greater production results when load
handling keeps pace with the capacity
of machines to produce. So — boost
your defense and civilian output—lower
your costs — with the 'Budgit' Electric
Hoist. The smallest 'Budgit' lifts 250
lbs. a foot in less than two seconds.
No more strained ligaments or other
injuries due to manual lifting. Hoisting
is safe, easy and fast because electricity
does all the heavy work.

The 'Budgit' is miserly in using elec-
tricity. It's a complete load lifting unit
in itself — no accessories to buy, no in-
stallation costs. Hang up, plug in, and
it's ready for work. Capacities: 250 to
4,000 lbs. A.C. and D.C. models. Priced
from \$119. Write for Bulletin No. 390
for more details.



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CORD TROLLEYS**—keep flex-
ible conductor cord up out of way
while carrying electricity to mono-
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curves, past switches.



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MUSKEGON, MICHIGAN**

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'Load Lifter' Hoists and other lifting specialties.
Makers of 'Ashcroft' Gauges, 'Hancock' Valves,
'Consolidated' Safety and Relief Valves, and
'American' Industrial Instruments.

We thrive on tough gear problems

More and more gear users rely on The Cincinnati Gear Company for their special gear needs, because they've found that we have the "know-how" to produce the right gears for their toughest requirements every time! And this "know-how" is backed up by the most modern production equipment, complete heat treating facilities, one of the largest shave cutter stocks, electronic inspection when required . . . everything our expert craftsmen need to produce top-quality custom gears consistently, economically.

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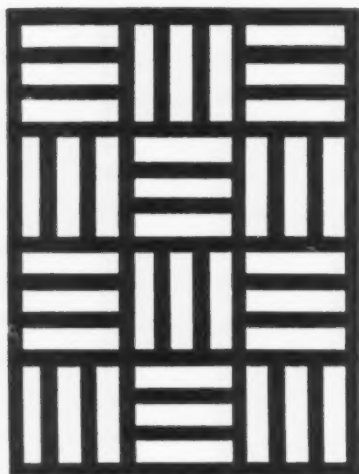
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Hendrick Ornametal — a decorative, lightweight metal grille designed for a wide variety of applications—is furnished in many attractive designs, the one illustrated being "Baskette."

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Architectural Grilles
Mitco Open Steel Flooring,
Shur-Site Treads, Armorgrids

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Manufacturing Company

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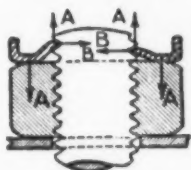
Ferroalloy Prices

Alsiifer , 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carloads	9.90
Ton lots	11.30
Calcium molybdate , 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo	\$1.15
Ferrocolumbium , 50-60% 2 in. x D, contract basis, delivered per pound contained Cb.	
Ton lots	\$4.90
Less ton lots	4.95
Ferro-Tantalum-Columbium , 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	\$3.75
Ferromolybdenum , 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo	\$1.32
Ferrophosphorus , electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	\$75.00
Ferrotitanium , 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.35
Ferrotitanium , 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.50
Less ton lots	1.55
Ferrotitanium , 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	\$177.00
Ferrotungsten , standard, lump or 1/4 x down, packed, per pound contained W5, ton lots, delivered	\$5.00
Molybdenic oxide , briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	\$1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa.	\$1.13
Simanal , 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢
Vanadium Pentoxide , 86-89% V ₂ O ₅ contract basis, per pound contained V ₂ O ₅	\$1.28
Zirconium , 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium , 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	7.00¢
Boron Agents	
Borosil , contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B	\$5.25
Bortam , f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Corbortam , Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2% C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00¢
Ferroboron , 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, Ton lots	\$1.20
F.o.b. Wash., Pa.; 100 lb up	
10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50
Grinnal , f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	\$1.00
No. 6	68¢
No. 79	50¢
Manganese - Boron , 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd	
Ton lots	\$1.46
Less ton lots	1.57
Nickel-Boron , 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered	
Less ton lots	\$1.30
Silenz , contract basis, delivered.	
Ton lots	45.00¢

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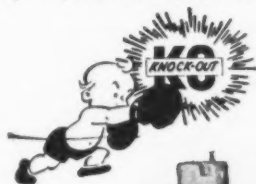
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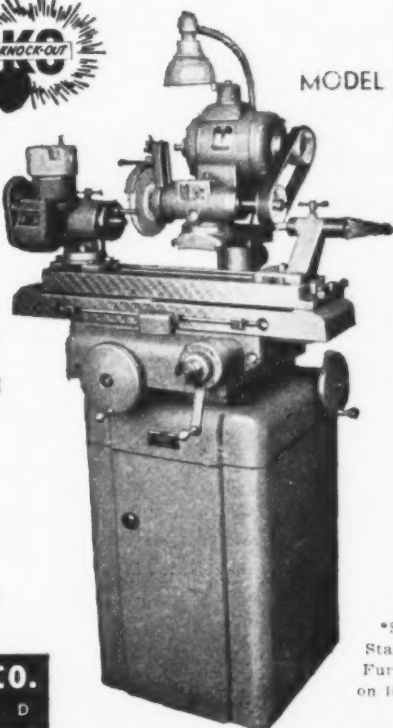


MODEL 8860

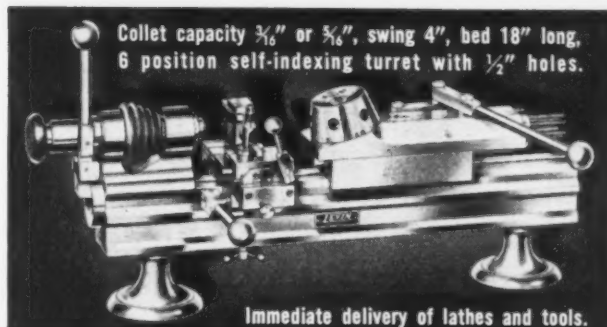
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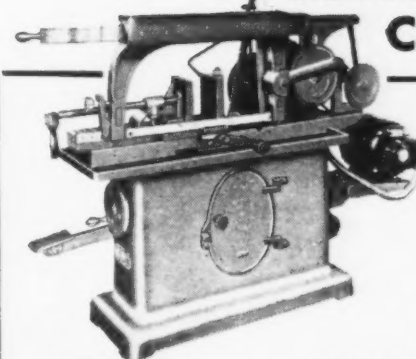
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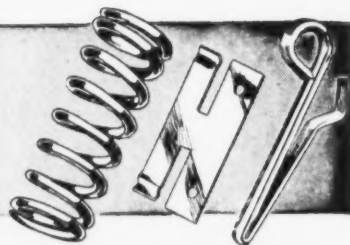
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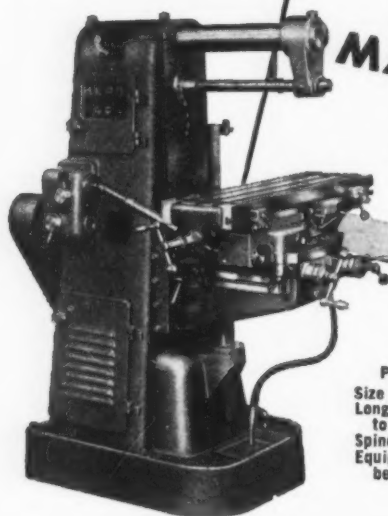
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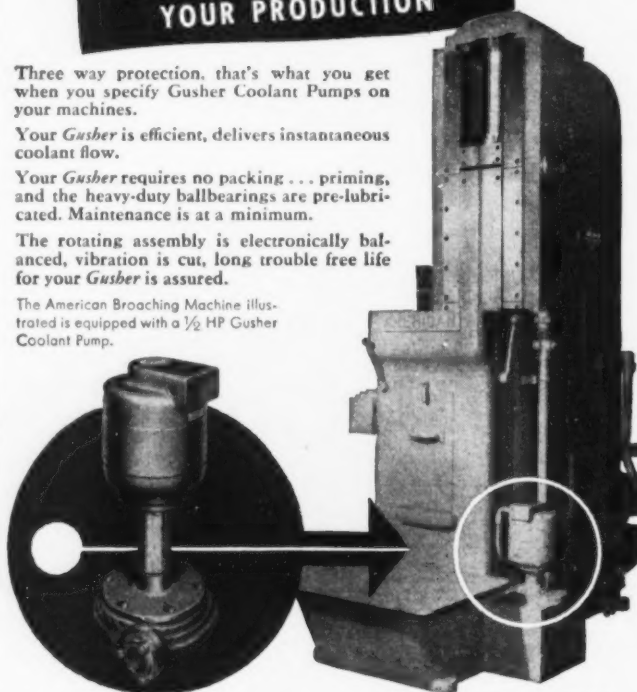
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Your *Gusher* is efficient, delivers instantaneous coolant flow.

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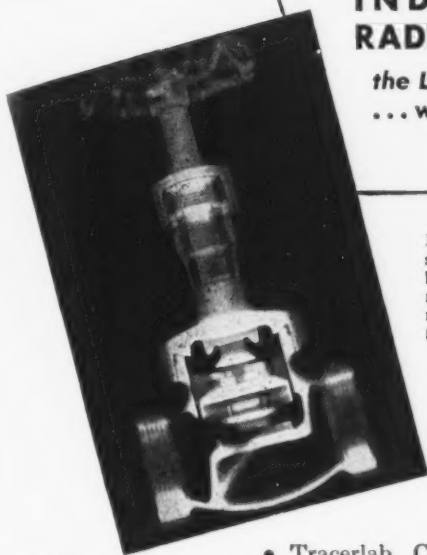


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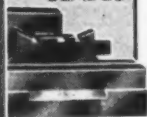
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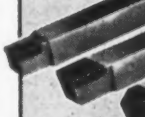
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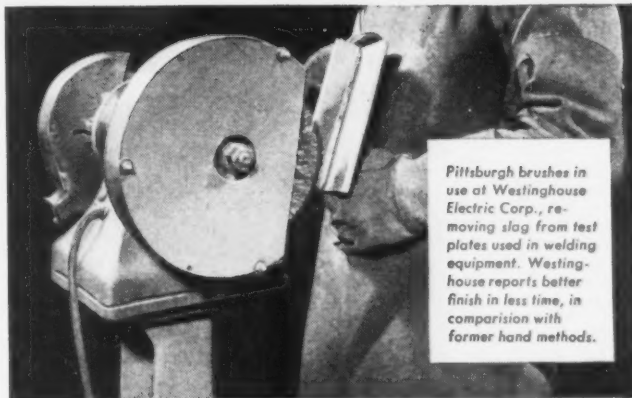
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Pittsburgh brushes in use at Westinghouse Electric Corp., removing slag from test plates used in welding equipment. Westinghouse reports better finish in less time, in comparison with former hand methods.

Replace hand finishing with power-driven Pittsburgh Brushes for

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—as these companies did:

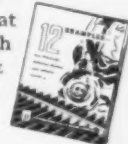
Removal of imbedded slag in welding test plates formerly was done by hand at the Westinghouse Electric Corp., Trafford, Pa., using a wire brush and welder's hammer. Pittsburgh brushes, powered by a direct-drive 1/2 h.p. motor, now remove more slag in less time, and produce a better finish. In addition, Westinghouse reports their Pittsburgh brushes "stand up better than average in use."

Complete cleaning of dried concrete, rust and scale from steel frames used in concrete forming is essential prior to re-using the forms. Pittsburgh wire brushes were installed at the Universal Form Clamp Co., Chicago. Working on a conveyor-fed machine, the Pittsburgh brushes now remove all foreign material at a rate of 50 pieces per hour, replacing former laborious hand brushing and scraping.

De-scaling preheated bar stock at the Dominion Forge & Stamping Co., Ltd., Canada, was formerly done by hand scraping. This never did a complete job, and inclusions resulted which produced defective forgings. Pittsburgh brushes, on specially-designed machines, now do the job, and have "increased efficiency, decreased the amount of scrap, improved work quality, and saved labor."

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Write today for a free copy of our booklet that shows, through actual case histories, how Pittsburgh cuts brushing costs. Address: PITTSBURGH PLATE GLASS COMPANY, Brush Div., Dept. W-10, 3221 Frederick Avenue, Baltimore 29, Maryland.



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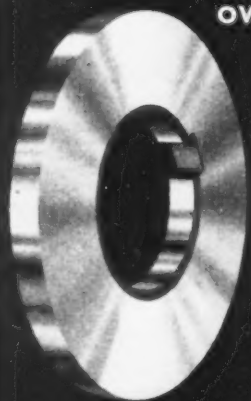
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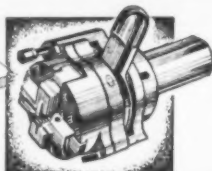
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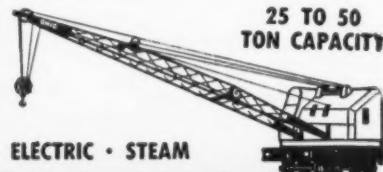
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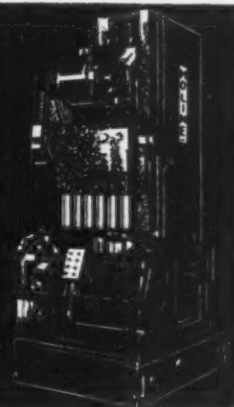
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Hill Clutch & Machine & Fdry. Co. Open Side Abrasive Belt Grinding Unit. Designed to accommodate slabs up to $\frac{3}{8}$ " thick x 30" wide x 30' long.

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6000 lb. Brosius Floor Type Gasoline Driven Charging Machine. Equipped with Peel, Gasoline Engine, Rubber Tires.

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5 Ton Whiting Two Leg Gantry Crane 52 Ft. Span Cab Control. Three Motors 220 v. 3 ph. 60 cy.

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75 Ton Morgan Ladle Crane 49'6" Span 4-Girder, With 25 Ton Auxiliary, Complete with 230 Volt D.C. Motors.

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5" Ajax Forging Machine or Upsetter, Motor driven. Equipped with Air Clutch.

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15 ton Heroult Model V-12 Electric Melting Furnace Top Charge hydraulically operated. Complete with Transformer Equipment.

25 ton Moore Size "NT" Melting Furnace, with 7500 KVA Transformer 13,200 vo. 3 ph. 60 cy.

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35 ton Counter Blow Drop Forge Hammer Steam or Air Operated.

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1000 ton Bliss #27 Knuckle Joint, Embossing & Coining Press, $2\frac{1}{2}$ " stroke, 18" Shut Height.

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2500 ton Hydraulic Bending & Trimming Press, Distance between columns 90" x 108".

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8' x 10" Schmitz Single Stand Two High With Friction Drive Rewinder.

12 $\frac{1}{2}$ " x 16" Philadelphia Two High Cold Rolling Mill. Complete with Pinion Stand, 75 H.P. Motor 440/3/60. Starter and Controls, Incl. Coiler.

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76" Mesta Slitter, Complete with Mesta Feed Reel, Mesta Upcoiler and Electrical Equip.

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No. 3 Medart 3-Roll Straightening Machine Capacity 1" to $3\frac{1}{2}$ " Bars or $4\frac{1}{2}$ " O. D. Pipe or Tubing. NEW 1950.

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300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine.

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No. 28U-30 Buffalo Armor Plate Universal Ironworker—Combination Punch, Shear & Bar Cutter. Motor Driven Capacities—Shear 3" Round, $2\frac{1}{2}$ " Square, $5 \times 1\frac{1}{8}$ " Flat, $5 \times 5 \times \frac{1}{8}$ " Angles 12"—31 $\frac{1}{2}$ " Beams, etc., Punch 1 $\frac{1}{2}$ " thru 1 $\frac{1}{4}$ ".

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The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Price Book—Fiasco of the used machinery price book continues. At press time, indications were that the price listings might go to the government printer on Thursday, Dec. 11. If it did, Office of Price Stabilization's estimate is that the book will be ready for distribution around Jan. 2. Dealers can't be blamed if they don't take this date too seriously in view of the countless deadlines that have been set and missed in the past.

OPS, however, would not even make a definite commitment on whether or not a price book will be issued. Best guesses of informed sources in OPS is that the book will be published.

Mystery — There is a certain amount of mystery connected with recent delay. The price listing has been ready for photo-offsetting for more than a month. About 3 weeks ago, work was stopped because the Budget Committee wanted to discuss the matter of whether or not the book should be put out. They gave it the green light, but for some reason the material wasn't sent to the printer.

Last week the Budget Committee was again considering whether or not to go ahead with the printing. OPS vaguely suggests that the problem involves financing the cost of the book, but since the costs have already been accounted for, this line of reasoning is a little obscure.

Mishandled — Undoubtedly a large part of the current confusion is unavoidable. Growing pressure in Washington for decontrol and the mixup caused by the change in Administrations are both adding to the chaos. However, this latest jumble is only one more indication of the government's mismanagement and lack of planning on this program. There is no ducking the fact that the book should have been out many months ago.

On the encouraging side is the fact that Ralph Irwin, OPS Ma-

chine Tool Div., told THE IRON AGE he is staunchly in favor of putting out the price book even if it is assumed that price controls will be junked. He agrees with dealers that even though the original purpose of the price listings would be eliminated with the scrapping of controls, it would still be of great value to both dealers and their customers.

With or without price controls, the new price book is desperately needed as a general machine tool catalog. The only overall handbook dealers have at present is the old OPA listing put out in 1941.

Helps Buyers — A new price book would give prospective buyers of used machinery a rough idea on prices of different machine tools. For dealers, it would serve as a pricing yardstick to determine the value of used machine tools which are out of their usual line. In instances where little more than the serial number of a machine is known, the price book could be used to determine the age of the tool and other data.

Another factor which makes issuance of the price book a must, even if controls are abandoned, is its use if controls were brought in again at a later date. With the uncertainty of developments in Korea and the unrest in Asia and the Middle East, future pressures on the American economy cannot be determined. Possibility of a return of price controls will never be far away.

No Delay—If a price book were already in existence when controls were re-imposed, it would be a simple matter for OPS to issue a few regulations to make whatever price revisions might be needed to bring the book up to date. Used machinery dealers would not be placed in their current, almost impossible, position of trying to abide by controls without having necessary price information.

—THE CLEARING HOUSE—

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14" x 12" Pennsylvania Air Compressor, 100# Pressure, Complete with 75 H.P. Syn. Motor
18" x 11" x 11" Sullivan WJ-3 Air Compressor 885 C.F.M. Driven by 150 H.P. Westinghouse Syn. Motor 410/2/60

BAR TURNING MACHINE

Medart HF-2 Bar Turning Machine, Capacity 1" to 2 1/2". Complete with Accessories

BENDER

Size 818 Parker Model CS Production Tube Bender, Capacity 1/2" to 3" O.D.

BENDING ROLLS

12"x36" Niles Pyramid Type Bending Roll
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16"x9/16" Bertach Bending Roll, Motor Driven
16"x1 1/2" Hilles & Jones Pyramid Type Bending Roll
20"x1 1/2" Southark Pyramid Type Bending Roll
20"x1 1/2" Southark Pyramid Type, Motor Driven

BRACKS—LEAF TYPE

8" x 1 1/2" Dreis & Krump Leaf Type Bending Brake Motor Dr. with 40 H.P. A.C. Motor
12" x 3/16" Chicago #226 Steel Apron Brake, M.D.
16" x 3/4" Dreis & Krump Leaf Type Bending Brake Motor Dr. with 40 H.P. A.C. Motor

BRACKS—PRESS TYPE

14" All Steel Hydraulic Press Brake 500 Ton Cap. 1/2"

CHARGING MACHINE

6000 lb. Brosius Floor Type Gasoline Driven Charging Machine, Equipped with Peel, Buda Gasoline Engine, Rubber Tires

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Two Trolleys and 5 Motors 440 volt 3 phase 60 cycle

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75 ton Morgan Ladle Crane 49'6" Span 4-Girder Construction, with 25 Ton Auxiliary, Complete with Motors for 220 Volt D.C.

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton Robbins Myers	28'6" Span 220/3/90
7 1/2 ton Shepard Niles	80' Span 440/3/60 AC
10 ton Shaw	67' Span 230 Volt D.C.
10 ton P&H	67' Span 230 Volt D.C.
Equipped with 2 hooks spaced 11' apart	
10 ton Erie	60' Span 440/3/60 AC
15 ton Niles	60' Span 230 Volt D.C.
20 ton Bedford	50' Span 220/3/60
20 ton Morgan	68' Span 230 Volt DC
With 5 ton Auxiliary	
25 ton Morgan	47'10" Span 230 Volt DC

DIEING MACHINES

75 ton Henck & Wright High Speed Dieing Machine Double Roll Feed, Scrap Cutter, 3" Stroke
100 ton Henry & Wright Dieing Machine, 4" Stroke, 13" Shut Height, Complete Elec. Equip.

DIE CASTING MACHINE

Model BA-12 KUX Die Casting Machine, Air operated, Plunger Gosseneck Type for zinc, lead and tin. Die space between bars 12 1/2" x 12 1/2". Die Separates 8" NEW 1919, never used

DRAW BENCH

15,000 lb. United Draw Bench, Length of tube to be drawn 31 ft. Motor Driven
50,000 lb. Draw Bench, Motor Driven with 50 H.P. Motor, Maximum Draw 40 ft.

FLANGING MACHINE

4" McCabe Pneumatic Flanging Machine, Pneumatic Holdowns, Circle Flanging Attachment

FORGING MACHINES

1 1/2", 2", 3", 4", 5", 6" Ajax
1", 2", 3", 5" Acme
5 Ajax—Air Clutch

FURNACE—ANNEALING

Furnace Engr. Co. Bell Type Annealing Furnace Gas Fired Output, 50"x40" Round, 500 CFM Cap.

FURNACE—HEATING

NEW Oil Fired Surface Combustion Furnace Inside width 3', Length 13', Opening 8", 4840 lb per hour net work to 2200° F.
60 KW Leeds & Northrup Homo Furnace #9478-UR-28, With controls, Work space 28" dia. x 28" deep

FURNACES—MELTING

100 lb. Moore Type "UT" Melting Furnace, Ton Charge, Complete with Transformer, New 1943—Little Used
1000 lb. Model "UT" Stroman Tilting Type Melting Furnace, Oil Fired
6000 lb. E.I.S. Nose Tilting Furnace, Complete with Transformer Equipment

15 ton Heroult Model V-12 Ton Charge Hydraulically Operated, Complete with Transformer Equip.

GEAR REDUCERS

500 H.P. United Combination Reduction Gear & Pinion Stand, Gear Ratio 8.581:1
600 H.P. Farrell Birmingham, Size 18 Reduction Gear, Ratio 720 to 244 RPM
700 H.P. Falk Single Reduction Gear, Ratio 875 to 200 RPM
1800 H.P. Mesta Gear Reduction Unit, Ratio 19:1

GRINDER

No. 4 Cincinnati Centerless Grinder, Motor Driven, Capacity standard work rest 2" to 6" dia., optional work rest 1/2" to 3". Special fixtures will allow work to be handled up to 9" dia.

GRINDER—CYLINDRICAL

14x36" Norton Type C, Complete with Elec. Equip.

HAMMERS—BOARD DROP

1200, 1600, 2500 lb. Chambersburg
1600, 2000 lb. Billings & Spencer

HAMMER—COUNTER BLOW TYPE

35 ton Counter Blow Drop Forge Hammer, Steam or Air Operated

HAMMER—STEAM DROP

2000, 2500 lb. Chambersburg
1500 lb. Erie

HAMMERS—STEAM FORGING

1200 lb. Massillon Single Frame
1,000, 1600, 2000, 3000, 4000, 6000 lb. Chambersburg
600, 1500, 2500 lb. N.B.P.
600, 1100, 1500, 2000, 2,400, 3500, 4000 Erie

HAMMERS—MISCELLANEOUS

No. 6N Nazel Hammer, Geared Motor Drive
200 lb. Bradley Compact Hammer, Arr. for Motor Drive with 10 H.P. A.C. Motor
2000 lb. Chambersburg Pneumatic Hammer Complete with Elec. Equip. New 1951
15"x12" Chambersburg Cecostamp Hammer, 18" stroke

LATHE—TURRET

Model 2L Glaholt Geared Head Turret Lathe, Spindle Bore 4-1/16", Elec. Equipment and numerous accessories incl. NEW 1951

LEVELER—ROLLER

60" Aetna Standard 17-Roll Leveler, 4 1/2", Dia. Rolls Arr. Motor Drive

MOTORS

1250 H.P. Westinghouse Induction Motor 6000 volt, 3 phase 60 cycle 593 R.P.M.
2000 H.P. General Elec. Induction Motor 6000 volt, 3 phase 60 cycle 600 R.P.M.
2500 H.P. General Elec. Direct Current Motor 6000 volt 175/350 R.P.M.

MOTOR GENERATOR SET

740 H.P. General Electric Syn. Motor 4400 volt A.C. with two generators 750 KVA 230 volt D.C., Complete with Panel Board, etc.

NAIL MAKING MACHINES

No. 1 1/2 National—Sizes 10D, 12D, 16D, 20D, 30D
No. 3 National—Size 6V
No. 2—Glader—Sizes 6D, 7D, 8D, 9D
Angell—Sizes 10D, 12D, 16D, roofing

PRESSES—EXTRUSION

700 ton Horizontal Extrusion Press, 3-Column Type Ram 26" Diameter, Container suitable for billets 5" x 20"
1200 ton Horizontal Extrusion Press, 3-Column Type Ram 34" Diameter, Suitable for billets 6" dia. x 22" long

WE OFFER A COMPLETE LIQUIDATION SERVICE ON ANY BASIS WHICH CIRCUMSTANCES INDICATE WOULD BE MOST BENEFICIAL, WHETHER BY AUCTION, PRIVATE LIQUIDATION OR OUTRIGHT SALE

CONSULTANTS IN MANUFACTURING PROBLEMS FOR OVER A QUARTER OF A CENTURY

THERE IS NO SUBSTITUTE FOR EXPERIENCE

CONTACT US IN CONFIDENCE WITHOUT COST OR OBLIGATION

PRESSES—HYDRAULIC

Model BL-350 Milwaukee Hydraulic Briquetting Press Complete with Pumps, Capacity Grey Iron Briquettes 3 1/2 tons per hr.
200 ton Bliss Hydrodynamic 48" Stroke Bed Area 24" x 24", Hyd. Pump Incl.
500 ton Southark, 20" Stroke, Distance Between Columns 30" x 14"
500 ton Southark Hydraulic 21" Stroke, 78" Daylight Platen 64" R to L x 32" F to B
500 ton Southark Open Throat Hydraulic Press 12" Stroke Platen 56" x 56"
700 ton Elmes Forming Press, 27" Stroke, 30" Dia. Ram, Platen 40" x 88" with overhang 40" x 120", Complete with Pump and Motor

PRESS—HYDRAULIC WHEEL

100 ton Elmes Inclined Hyd. Wheel Press 72" Between Parallel Bars, Complete with Pump and Motor

PRESS—KNUCKLE JOINT

#27 Bliss Knuckle Joint Embossing & Coining Press 1000 ton Capacity, 2 1/2" Stroke, 18" Shut Height

PRESSES—STRAIGHT SIDE

No. 305 Bliss 9" Stroke 14" Shut Height Equipped with Marquette Air Cushion
No. 59 Toledo Double Geared Tie Rod Press 255 ton Friction Clutch 18" Stroke 36 1/4" x 35" Bed Area
No. 3 Ferrante Super Speed Punch Press 30 ton Capacity, NEW 1946—never used
No. 620 Bliss High Production Press, 1 1/2" Stroke SI-40 Verson 200 ton Press, 30" Stroke, Bed Area 40" x 41"
No. 12 Zeh & Hahnemann Patent Percussion Press 150 ton 12" Stroke, 17" x 17" Bed Area
No. 1037-5 Hamilton 300 Ton 16" Stroke, Bed Area 48" x 104"

PRESS—TOGGLE DRAWING

No. 410A Bliss 650 Ton Double Crank Strokes 25" & 17" Bed Area 60" x 81"

PRESSES—TRIMMING

Bliss S.S. Trimming Press with Side Shear, 250 Ton Capacity, 8" Stroke 52" x 30" Bed Area
No. 3 Erie Flywheel Drive Trimming Press, 3 1/2" Stroke, 13" Between Guides
1500 ton Hydraulic Bending & Trimming Press, Distance between columns 86" x 86"
2500 ton Hydraulic Bending & Trimming Press, Distance between columns 90" x 108"

PUNCH & SHEAR COMBINATIONS

No. 25 U-30 Buffalo Armor Plate Universal Iron-worker, Capacity Punch 1 1/2" thru 1 1/2", Shear 3" Round 3 1/2" Square, 5 x 1 1/2" Flat, 5 x 5 1/2" Angles
Style EF Cleveland Single End Punch & Shear, M.D. Capacity Punch 1" thru 1 1/2"
Wickes Single End Punch & Shear, 48" Throat Capacity Punch 2 1/2" thru 1 1/2", Motor Driven

RIVETER

125 ton Hanna Bull Riveter, Air Driven, 24" Gap, 75" Reach, Capacity 1" rivets cold and 1 1/2" rivets hot

ROLL—PLATE STRAIGHTENING

7 Roll Bertsch Plate Straightening Machine, Capacity 10" x 36", Complete Elec. Equip.

ROLLING MILLS

7 1/2" Steelk Four High Rolling Mill, Max. Steel Width 6", Work Rolls 2 1/2" x 7 1/2", Complete with electrical equipment
8"x10" Schmitz Single Stand Two High
12"x16" Single Stand Two High, Comp. with Elec. Equip.
12"x24" Waterbury Farrel Two High
15"x30" Mossberg Single Stand Two High
18"x24" Waterbury Farrel Two Stand Two High
20"x30" Two Stand Two High Rolling Mill
20"x30" Poole Two Stand Two High
22"x40" Single Stand Two High
27"x56" United Two High Skin-pass Mill
28"x60" Single Stand Two High
18"x60" Three High Roughing Mill, Complete with billet heating furnace and accessory equipment incl. elec. equip.

SAWS

No. 719 Espen-Lucas Heavy Duty Cold Saw, Capacity up to and incl. cakes or slabs 48" x 7" Stroke 72", Motor Driven
No. 3 Ryerson Friction Saw, 54" Blade Hydraulic Feed, Complete with Elec. Equip.
52" Ryerson Friction Saw, 45 H.P. Motor, Capacity Approx. 9" Round, 20" I-beam, 12" H-beam

SHEAR—ALLIGATOR

No. 2 Thomas Carlin Alligator Shear, 16" Blade, 30 H.P., D.C. Motor

SHEARS—ANGLE

Hilles & Jones No. 2 Double Angle Shear, M.D. Capacity 6" x 6" x 3/8"
Long & Allstatter Double Angle Shear, Model H Capacity 6x6x3/4", Complete with Elec. Equip.

SHEAR—BAR

No. LH Lewis Open End Bar Shear, Motor Drive, Capacity 1 1/2" Round

SHEAR—MISCELLANEOUS

United Oil Hydraulic Up-Cut Shear Complete with Pump, Motor and Tank, 36" Knives, 8" Stroke, Pressure Between Knives 360,000± at oil pressure of 2000± per sq. in.

SHEARS—ROTARY

No. 69 Quickwork Rotary Shear, 3/4" Capacity
No. 100 Kling Rotary Shear, 1" Capacity
No. 30 Quickwork Rotary Shear 5/16" Capacity
Quickwork Heavy Duty Circle Shear 3/4" Capacity Complete with Circle Cutting Attachment
No. 25A Quickwork Whiting Rotary Shear 1/4" Capacity, with Circle Cutting Attachment, Motor Driven

SHEARS—SQUARING

12"x3/16" Stameo Steel Squaring Shear, Motor Dr 6"x3/4" Long & Allstatter, Belted Motor Drive

SLITTERS

18" Slitter, Motor Driven, Complete with Expanded Pay-Off Reel and Recoiler
24" Torrington Heavy Duty Slitter, Capacity 5 cuts 1/4" mild steel
31" Yoder Sheet Slitter No. 530, Capacity 3 cuts 194" to 8 cuts 156", Motor Dr.
72" Yoder Gang Slitter, Capacity 5 cuts 20 Ga.

SLITTING LINE

76" Mesta Slitter, Complete with Mesta Feed Reel Mesta Upcoiler and Elec. Equip.

STRAIGHTENERS

No. 3 Mestart 3-Roll Straightening Machine Capacity 1" to 3 1/2" bars or 4 1/2" O.D. Pipe or Tubing, NEW 1950
No. 1 1/2B Sutton Round Straightener, Motor Dr. Capacity Tubing 5/16" to 2 3/4"—modified to handle up to 3 1/2" O.D. tubing.
No. 1B Sutton Round Straightener, Motor Drive Capacity 3/16" to 3/4" O.D. Friction Drive complete with 1/3 H.P. A.C. Motor
Hallden 8-Roll Strip Straightener & Cutting Machine, Capacity 1 1/2" wide 11 Ga. Sheet Steel

STRETCHER

McKay Hydraulic Bar Stretcher, Capacity up to 1 1/4" dia. In length 12" to 27"

SWAGING MACHINES

No. E4 Langeller, Capacity 1 1/2" Tubing
No. 408 Etna Swager, Capacity 4" Tubing

TESTING MACHINES

300,000± Southark Emery Universal Hydraulic

THREAD ROLLER

Model "C" Watson Flagg Precision Thread Roller Capacity up to 3", Incl. Accessories & Electrical Equipment

WELDERS

250 KVA Progressive Model A-6 Flash Welder 440 volt 60 cycle, Mechanical Contactor HI-Pressure Clamp Assembly—NEW 1949
10,000± Ransome Welding Positioner, Rectangular Table 84" x 84" x 1 1/2"
McKay Tube or Pipe Welding Unit, Capacity 4 1/2" to 7 1/2" O.D. Complete with all accessory equipment and motors

WIRE DRAWING MACHINE

No. 0 Waterbury Farrel 7-Die Wire Drawing Machine, Capacity 1/4" rod to #10 copper

• Manufacturing

RITTERBUSH MACHINERY INC.
50 CHURCH ST., NEW YORK CITY 8

Equipment

Confidential Certified Appraisals
Liquidations—Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

December 18, 1952

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THE CLEARING HOUSE

RE-NU-BILT GUARANTEED ELECTRIC POWER EQUIPMENT D.C. MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	2200	G.E.	MCF	600	400/500
1	1750	Whse.		600	550/700
1	1500	Whse.		525	600
1	940	Whse.	QM	250	140/170
1	600	Al. Ch.		250	400/500
1	500	Whse.	CC-318	600	300/900
1	450	Whse.		550	415
1	400	G.E.	MCF	550	300/1050
1	350	Cr. Wh.	CCM-151H	230	1100
1	335	Whse.	MQ	250	900/900
1	300/300	G.E.	MPC	230	360/920
1	290	Rel.	1870T	230	730
1	150	G.E.		600	250/750
1	150	Rel.	1400T	230	400/1200
1	150	Cr. Wh.	85H	230	1150
10	150	Cr. Wh.	83H-TEFC	230	960
1	150	Whse.	SK151B	230	900/1800
1	150	Whse.	SK-201	230	360/950
1	50/120	G.E.	MCF	230	250/1900
1	100	Whse.	SK-181	230	450/1000
1	100	G.E.	CDP-115	230	1750

MILL & CRANE

1	50	G.E.	CO-1810	230	725
1	35	Whse.	K-5	230	305
2	30	G.E.	MD-104 1/4 A	550	700
1	30	Whse.	K-5	230	975
4	15	Whse.	K-5	230	630
1	10	C.W.	SCM-AH	230	1150
1	10	G.E.	MD-104	230	400/800
4	5.25	Whse.	K-5	230	680
4	3	C.W.	SCM-PP	230	1750
1	3	Whse.	HK-3	230	835
1	1 1/4	Whse.	K-1	230	835

A.C. MOTORS 3 phase—60 cycle SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1800	G.E.	MT-488	2300	360
1	1500	ABB		2300	730
1	1200	G.E.	MP	2300	375
1	500	Whse.	CW	550	850
1	500	G.E.	IM	440	900
1	500	G.E.	M-574-Y	440	900
1	500	G.E.	IP	550	805
1	400	Whse.	CW	440	814
1	350	G.E.	MT-442Y	2300/4000	253
1	350	Al. Ch.		440	505
1	350	G.E.	MT-434-Y	4000	297
1	250	G.E.	MT-559B	2300	1800
1	250	Al. Ch.		550	900
1	200	Cr. Wh.	30QB	440	505
1	200	G.E.	IM17	350	585
1	200	G.E.	IM-17	440	600
1	200	G.E.	IM	440	635
1	200	G.E.	MTP	440	1170
1	150 (unused)	Whse.	CW	2300	435
1	125	Al. Ch.		440	730
4	125	G.E.	MT-560Y	440/2200	435
3	100	G.E.	IM	440	600
3	100	A.C.	ANY	440	605
1	100	G.E.	TM-16	2300	435
1	100	Whse.	CW-888A	440	700

SQUIRREL CAGE

1	950	G.E.	FT-559BY	440	8570
1	450	Whse.	CR-1430	2300/4150	354
1	300	Al. Ch.		2300	385
1	300	G.E.	IK-17	440	880
1	200	G.E.	IK	440	845
1	200	G.E.	KT-557	440	1300
1	150	Whse.	CR-856A	440	850
1	150	Whse.	CR	440	580
1	150/75	G.E.	IK	440	900/450
1	125	Al. Ch.	ARW	2200	1750
1	125	G.E.	KP-6338-Z	440/2200	3585
1	125	Whse.	MR	440	485

SYNCHRONOUS

3	8500	G.E.	TS	2300	257
3	2100	G.E.	ATT	2300	800
3	1750	G.E.	ATT	2300	8600
2	2000	Whse.		2300	120
3	735	G.E.	ATT	2300/12000	600
1	450	Whse.		2300	450
3	350	G.E.	TS	2300	156

M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
3	3000	G.E.	500	660	11000*
1	2000	G.E.	514	600	6600/13200
1	1500	G.E.	514	250	6600/13200
1	1500	G.E.	720	600	6600/13200
1	1500	G.E.	900	275	4400
3	1000	Whse.	900	600	4160
1	1000	G.E.	900	280	6000
1	1000 (ST)	G.E.	900	250	2200
1	750	Whse.	900	375	4160
1	500	G.E.	720	125	2300
1	500	Whse.	900	125/250	440
1	500	Whse.	900	250	6000/13200
1	500	Whse.	1200	125/250	2300
1	400	Whse.	1200	250	2300
1	400 (ST)	Cr. Wh.	1200	125/250	2300
1	350	G.E.	900	125	2300/4160
1	300	Al. Ch.	1200	125/250	2300
1	150	Whse.	1200	275	2300
1	140 (ST)	Cr. Wh.	600	125/250	440/2300
1	100	Delco	1200	138/240	2300
1	100	G.E.	1170	125	220/440

* 35 Cycle

FREQUENCY CHANGER SETS

Qu.	KW	Make	Freq.	Voltagess
1	3000	G.E.	25/60	2300/2300/4000
1	2500	G.E.	25/62.5	2300/2300
1	1000	G.E.	25/58.3	4400/2300
1	500	Al. Ch.	25/60	11000/2300

BELYEA COMPANY, INC.
47 Howell Street, Jersey City 6, N. J.

MILES' QUALITY

AIR COMPRESSOR, 21"x13"x16" Worthington
AUTOMATIC, 20"x25" Fay (1942)
AUTOMATIC, 8" Bullard Multi-Au-Matic, 6-spindle
AUTOMATIC, 6-spindle Baird chucker
AUTOMATIC, 3/4" x 3/4" Cleveland "A"
BORING MILL, 4" Detrick & Harvey, horiz. floor type
BRAKE, 8" Cincinnati, 65 ton, press
BROACH, No. 1 Foote Burt duplex surface
BROACH, 12 ton No. V2 American Vertical
BROACH, No. 3XA Oilgear horizontal hydraulic
BROACH, V42 American hydraulic, 18 ton
BULLDOZER, No. 22 Williams & White
DRILL, Nos. 217, 310, 321 Baker
DRILL, No. 36 H0 Baker hydraulic
DRILL, 21" & 24" Cincinnati, upright
DRILL, 12-spindle No. 12 Natco
DRILL, 12-spindle No. 10 DeLancey rail type
DRILL, No. B 250 H Natco multiple
DRILL, 36-spindle Bausch, adjustable spindle
DRILL, RADIAL, 3' Dreeses Simplex
DRILL, RADIAL, 3/2", 8" American sensitive
GEAR HOBBER, 72" Westinghouse
GEAR HOBBER, No. 12H G&E
GEAR HOBBER, No. 130 Cleveland Rigidhobber
GEAR HOBBER, No. 3 Adams Farwell
GEAR HOBBER, No. 12 & Type A Barber Colman
GEAR HOBBER, Nos. 1 and 25 5A Lees Bradner
GEAR SHAPER, No. 7 Fellows
GEAR SHAVER, 8"-12" Red Ring
GEAR TESTER, No. 13 Gleason
GRINDERS, CENTERLESS, Two No. 2 Cincinnati
GRINDERS, 10"x18" & 10"x36" Norton Semi-Auto
GRINDER, DISC, 30", No. 8 Badger
GRINDER, DISC, No. 22B Hanchsett opposed
GRINDER, DISC, No. 84A Gardner opposed
GRINDER, GEAR, 10" Pratt & Whitney
GRINDER, Internal, Bryant Nos. 5, 16A, 16-2B & 24-36
GRINDERS, INTERNAL, Nos. 72A3 and 72A5 Heald
GRINDERS, SURFACE, 12" and 16" No. 22 Healds
GRINDER, SURFACE, No. 7B Wilmarth & Norman
HAMMER, Nos. 5N & 6B Hazel pneumatic
HAMMER, 40 lb. Bradley belt
HONE, Nos. 172 & 2610 Barnes hydraulic
LATHE, ENGINE, 24"x14" American
LATHE, TURRET, No. 5 Acme universal
LATHE, TURRET, No. 5 Gisholt universal, 1943
LATHE, TURRET, No. 6 W&S, G. H. motor-in-base
LATHE, TURRET, 36" Rogers vertical
MILLERS, Two No. 2 Cincinnati plain
MILLER, 18" Cincinnati automatic
MILLER, 24" Cincinnati automatic duplex
MILLER, type 45 Product-O-Matic
MILLER, 30/2" x 21" x 12" Ingersoll 4-spindle planer type
MILLER, 48" x 20" x 20" Ingersoll planer type, 3 vertical heads
MILLER, 48" x 36" x 12" Ingersoll planer type adj. rail
MILLER, 84" Ingersoll 6-spindle rotary continuous
MILLER, PLAIN, No. 3B Milwaukee
MILLER THREAD, Type C Hall planetary
MILLER, THREAD, Nos. 4, 6 and CT 36 Lees Bradner
NIBBLER, No. 3 Savage rotary
PLANER, 36"x36"x12" Niles Bement Pond
PRESS, No. 61 Cleveland OBI
PRESS, No. 6 Toledo OBI
PRESSES, Nos. 56 & 56 1/2 Toledo
PRESS, No. 245 1/2 Hamilton s.s. tiered frame
PRESS, No. EG54 Ferracute knuckle joint
PRESS, 600 ton No. 570 Toledo forging
PRESS, No. DAB411 Hamilton double action toggle
PRESS, 100 ton HPM hydraulic
RIVETERS, large variety
ROLL, 20"x3/16" Farnham bending
SLOTTER, 16" Bement Miles crank
SAWS, Three 816S Kalamazoo metal cutting band
SAW, 7" No. 14 Higley cold-cutting
SHAPER, 24" American auto, oiled
SHAPER, 32" Ohio Dreadnaught
SHAPER, 27" Morton draw cut
SHEAR, 8"x10 ga. Ohi squaring
SHEAR, 38" throat No. 17F New Duty
STRAIGHTENER, No. 0 Sutton for bars
SWAGER, No. 154 Etna
TAPPERS, Two No. 71 Ettco
TESTER, 230,000 inch-pound Tinius-Olsen No. 2 torsion
TESTER, 100,000 lb. Riehle tensile & compression
THREADERS, 2" Landis pipe threading and cutting
THREADERS, Two 3/4" Landis, double spindle
THREADERS, 2" Oster rotary head
UPSETTER, 3" National air clutch
UPSETTERS, Two 4" Ajax heavy duty, twin-gear
WELDER, 100 KVA Thompson automatic spot
WELDER, 100 KVA National Flash

WRITE FOR CATALOG NO. 193 FOR COMPLETE LISTING

MILES MACHINERY CO.
2025 E. Genesee Ave.
SAGINAW, MICHIGAN

GUARANTEED TOOLS

16"x78" SIDNEY Toolroom Lathe, chuck, taper, new 1947
60"x20" NILES-BEMENT-POND Geared Head Engine Lathe, rapid traverse
27"x12" MONARCH Geared Head Engine Lathe, taper attachment, AC-MD
24"x72" centers BOYE & EMMES Heavy Geared Head Engine, chuck, AC-MD
No. 2B FOSTER Geared Head Turret Lathe, rapid traverse, AC motors

No. 3L GISHOLT Turret Lathe, 6/4" hole in spindle, bar feed, chuck, tooling, new 1945

42" BULLARD New Era Type Vertical Turret Lathe, AC-MD
36" BULLARD Vertical Turret Lathe converted to Spiral Drive, AC-MD
1 1/2" LANDIS Double Head Bolt Threader, with leadscrews, MD

No. 1 DOUGLAS Plain Horizontal Mill, table 8"x32", power feeds, motor in base, No. 40 taper, new 1942

No. 2 VAN NORMAN Plain Horizontal Mill, power rapid traverse, No. 50 taper, new 1942

No. 3-24 CINCINNATI Plain Hydramatic Mill

5-13" column CARLTON Radial Drill AC motor on arm, 15 to 1500 RPM

4' AMERICAN High Speed Sensitive Radial Drill 9" column, AC motor on arm

No. 914 W. F. & John BARNES Hydraulic Drill, No. 6 Morse taper, 15HP motor, new 1948

3 Spindle FOSDICK Drill Press, individual AC motors for each spindle, 1942

No. 6 TOLEDO O.B.I. Press, 56 Tons

Brand New Model FH-4C01
DENNISON Hydraulic Presses, 4 Ton, 8" throat (3)

10"x24" NORTON Hydraulic Surface Grinder, 1942

25A HEALD Rotary Surface Grinder, 24" diameter, magnetic chuck

36" OHIO Dreadnaught Shaper, AC-MD

75 Ton HENRY & WRIGHT Double Crank Dieing Machine, roll feed & Scrap cutter

No. 22 MURCHEY Threader

No. 135 CLEVELAND Rigidhobbers

O'CONNELL MACHINERY CO.
Tel: BAiley 5800
1693 GENESEE ST. BUFFALO 11, N.Y.

Immediately Available WIRE WORKING MACHINERY

FOURSLIDES: Baird, Nilson & Manville, Nos. 0, 1, 2, 3, 4, 5, 3-20, 4-25
U. S. Tool Co. No. 22, 28, & 33 Multilides
Sleeper & Hartley Spring Coilers Nos. 0, 1, 2, 3, 3 1/2, 4, & 5
Vaughn Nos. 8, 10, & 12 Moto-Bloes
Waterbury No. 3 Bull Blocks, Duplex
Morgan 4 stand Wire Drawer with peeler and 100 H.P. motor drive & motor
Waterbury Nos. 1, 2, & 3 Continuous Wire Drawing Machines

PARTIAL STOCK LISTING

"The most diversified stock of machinery in the country. If it's machinery we have it."

NATIONAL MACHINERY EXCHANGE
128 Mott St., New York 13, N. Y.
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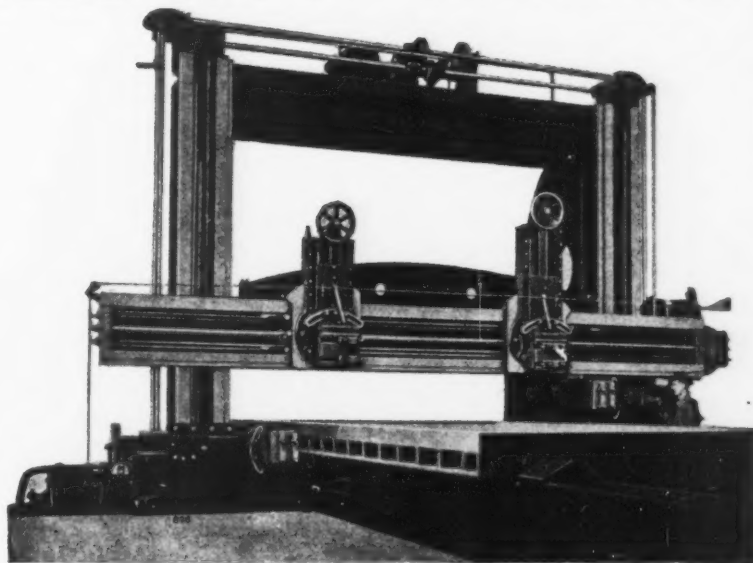
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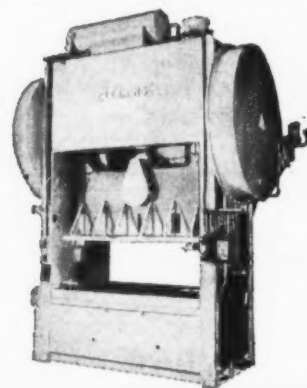
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32" Superior Drill
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No. 7, 7A Fellows, m.d.
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93 100 C.P.T.-I.R.	568 100 I.R.-C.P.T.
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166 135 I.R.-Am.	931 55 I.R.-Worth.
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SHAPERS: Cincinnati 20", Rockford 24"

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1—1800 HP SPEED REDUCER, ratio 19 to 1.
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No. 12 FELLOWS Gear Shaver, 1943.
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6" x 18" NORTON Vertical Spindle Surface Grinder.
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No. 73 HEALD Internal Centerless Grinders.
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No. 2 W&S Geared Friction Hd. Turret Lathe.
No. 3 J & L Ram Type Universal Turret Lathe.
No. 1L GISHOLT Saddle Type Turret Lathe, 1942.
Nos. 4D & 6S POTTER & JOHNSTON Auto. Lathes.
No. 3A W&S Saddle Type Univ. H.D. Turret Lathe.

MISCELLANEOUS

15" BETTS Vertical Slotter.
1/2 B P&W 2-spindle Reaming Machine.
4" TAYLOR & FENN Spline Miller.
6" P&W Upright Shaving Machine.
24"x24" 8" GRAY Double Housing Planer, 1941.
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HP-100 LaPointe Horizontal Hydraulic Broach. 1945.

No. 7 Gleason "Revex" Gear Rougher. 1943.

14"x168" Norton Plain Type C Grinder. 1942.

24-36 Bryant Hydraulic Internal Grinder.

No. 72A3 Heald Plain Hydraulic Internal Grinder. 1941.

27"x192" Niles "Timesaver" Engine Lathe. 1941.

27"x120" Lodge & Shipley Engine Lathe. 1940.

No. H5 Libby Universal Saddle Type Turret Lathe. 1939.

No. 3R Gisholt Universal Saddle Type Turret Lathe. 1942.

8"x84" Lo-Swing Semi-Automatic. 1941.

No. 3 Cincinnati Dial Type Vert. Mill. 1942.

No. M-18 Kearney & Trecker Simplex Mill. 1943.

3A Sundstrand Copy Mill.

460 Ton Verson Double Action Eccentric Press. 1940.

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60" Hanehett Face Grinder
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#2 Norton Tool & Cutter Grinder—Serial #3355
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Rowbottom Cam Millier—Serial 135/49. Rebuilt & guaranteed
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MISCELLANEOUS

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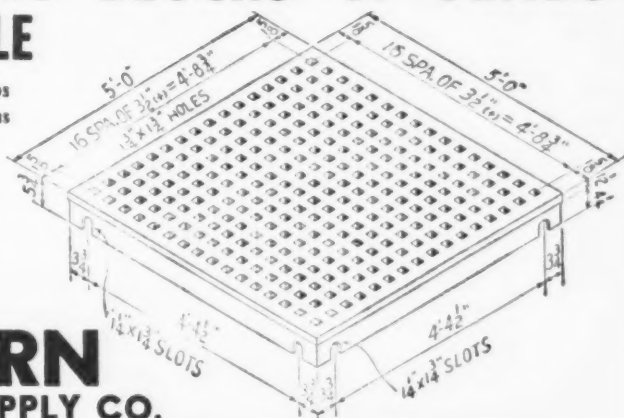
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Radial Drill, Cincinnati-Bickford, 5' x 13" column
Radial Drill, 6' x 15" Cincel.-Bickford, M.D.
Lathe, 32" x 16" Bridgeford heavy pattern grd. hd.
Lathe, 26" x 14" Lodge & Shipley, 9' c.e., mt. drive
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Boring Mill, 36" Bullard, Side Head, M.D.
Boring Mill, Bullard 24" Vertical Turret Lathe
Boring Mill, Lucas Horizontal, 8" Bar, M.D.
Hammer, Bradley 200# Rubber Helve
Punch, Hilles & Jones #5, single end 18" throat
Press, #78 1/2 Bliss S.S., M.D.
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Equipped with 220 volt, 3 phase dry type Rectifiers.

The welders are equipped with electronic controls.

Batteries not included.

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This is a battery powered, rocker arm type welding machine with a throat depth of 36". Progressive welder air operated DC Contactor, Weltronc Timer, Allen Unित्रon Rectifier.

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1***	2400	Whse.	Encl. (Rev.)	600
4***	1500	Whse.	Encl. (Rev.)	600
4***	1200	Whse.	Encl. (Rev.)	600
4***	800	Whse.	Encl. (Rev.)	600
1	350	G.E.	CD-169-A	1150
1	250/250	El. Dy.	No. 22	400/1200
1	250	G.E.	MPC	325/815
1***	200	G.E.	MPC	300/1200
1	200	Whse.	MPC	300/1200
1	180	G.E.	MPC	400
1*	150	C.W.	SK-190	890
1***	125	Whse.	SK-184	600
2	125	Whse.	SK-184	575/850
1	90/180	G.E.	MPC	625/1125
1	50	Whse.	SK	500/1500
1	50	Whse.	SK	250/1000
1	40	Whse.	SK-140	500/1700
1	35	G.E.	RF-14	500/1500
1	35	G.E.	CD-125	400/1200
1	35	G.E.	CD-147	500/1200
1	35	Rel.	25P	250/1000
1	32 1/2	Whse.	SK-150	400/1200
1*	30 7/8	Whse.	SK-151L	400/1200
1	30	Al. Ch.	E-145	400/1200
1	30	G.E.	CPM-105	875/1750
2	27 1/2	El. Dy.	15R	450/1350
1	25	Whse.	SK-125	500/1500
1	25	G.E.	RF-13	400/1600
1	25	Whse.	SK-140	400/1200
1	25	G.E.	CD-123	400/1200
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2	1500	G.E.	600	600	4150/2300
2	1000	Whse.	514	600	11000/6600
4	1000	G.E.	514	600	11000/6600
1	1000	G.E.	514	600	2300
1	500	C.W.	720	275	2300/440
1(3-U)	500	Whse.	1200	250	440
2	500	C.W.	720	275	2300/440
2	250	Whse.	1200	125/250	2300
1	200	Ridgway	900	275	2300
1	155	G.E.	720	250	2300/440
2	150	Whse.	1200	250	2300
1	100	Al. Ch.	1200	125/250	4000/2300
1	100	Delco	1200	275	440/220
1	100	Ridgway	1200	275	1000/2300
1	100	C.W.	1200	125	440/220
1	85	C.W.	1200	250	440/220
1	75	Al. Ch.	900	250	2300
1	75	Whse.	900	75	2300
1	50	Burke	1750	250	440/220
1	25	Ideal	1750	125	440/220
1	25	Al. Ch.	1200	250	440/220
1	20	Al. Ch.	1200	250	440/220
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1	1200	G.E.	MT-26	2200	277
2	1000	Al. Ch.	ANY	2200	225
1	800	G.E.	MT	2300	410
1	700	Whse.	CW	2300	720
1	600	G.E.	MT-20	2300	360
1	500	Al. Ch.	ANY	2200	514
1	500	G.E.	Y-16-M	2300	450
1	400	G.E.	MT-418	2200	110
1	250	Whse.	CW-937	440	1200
1	250	Al. Ch.	ANY	440	720
1	250	G.E.	MT-414	2200	300
1	125	Whse.	CW-876	2200	900
1	100	Whse.	CW-760	440	1200
1	100	F.M.	IL-20-C	440	900
2	100	G.E.	X-15A-M	2300	514

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1	400	Whse.	NZ-806	2300	1200
1	400	G.E.	I-K	2200	514
1	400	G.E.	KT-412	2200	450
1	300	Whse.	CS-890	2300	1750
1	200	Whse.	CS-873-C	2200	1200
1	200	Al. Ch.	ARY	440	600
2	125	Al. Ch.	AR	2200	1750
1	125	Al. Ch.	AR	2300	514
1	125	C.W.	126-Q	440	430
2	100	Whse.	CS-663-C	440	1750
1	100	Al. Ch.	AR	550	720
1	100	Whse.	CS-938	2200	514
1	100	F.M.	IL-241	440	430
2	75	Al. Ch.	AR	2200	1750
1	75	G.E.	I-K	440	600
1	75	Al. Ch.	AR	2200	720
1	50	G.E.	KT	2300	1750
1	50	Al. Ch.	AR	440	800

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HP	VOLTS	MAKE	TYPE	SPEED	WDG.
400	2200	G.E.	MT	450	S.R.
300	2200/4000	G.E.	IM	450	S.R.
200	2200	G.E.	IM	600	S.R.
150	220/440	G.E.	ATI	600	Syn.

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Also 230 V. DC motors rated 400-200-125-75-50 HP

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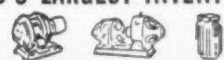
400 KW West.	720 RPM 600 V. Syn.	3/60/2300 v.
300 KW G.E.	1200 RPM 250 V. Syn.	2300/4000 v.
240 KW G.E.	1200 RPM 250 V. Syn.	2300/4000 v.
225 KW G.E.	1200 RPM 125 V. Syn.	2300/4000 v.
150 KW G.E.	1200 RPM 250 V. Syn.	2300/4000 v.
100 KW Ridg.	1200 RPM 250 V. Syn.	2300/4000 v.
75 KW West.	1200 RPM 250 V. Syn.	220/440 v.
50 KW G.E.	1200 RPM 250 V. Sq. Cg.	220/440v.
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SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Standard Time, on Tuesday, December 30, 1952, for Contract 437, for furnishing, testing, delivering and unloading gasoline-engine generator sets with switchgear and appurtenances for the West Branch and the Kensico South effluent chambers of the Delaware Aqueduct, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of two thousand dollars (\$2,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, requirements as to surety, etc., can be obtained in Room 1316 at the above address, upon application in person or by mail, by depositing the sum of five dollars (\$5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars (\$4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

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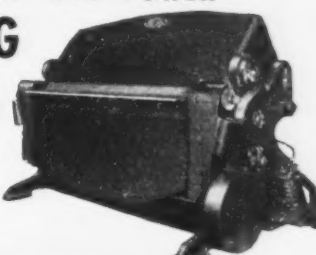
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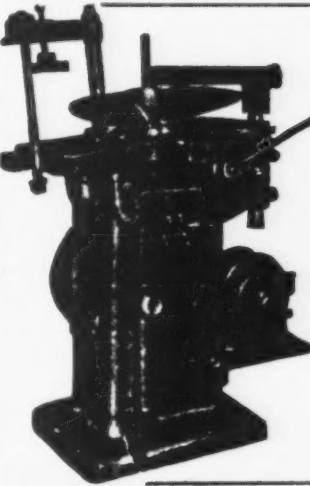
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